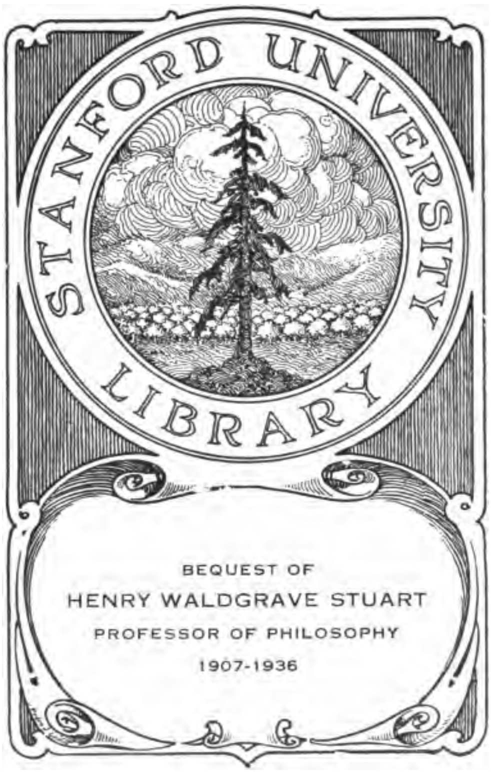

STANFORD UNIVERSITY LIBRARY
BEQUEST OF
HENRY WALDGRAVE STUART
PROFESSOR OF PHILOSOPHY
1907-1936

Henry W. Stuart
January 1910

THE WORKS OF ARISTOTLE

TRANSLATED INTO ENGLISH
UNDER THE EDITORSHIP
OF

J. A. SMITH M.A.
FELLOW OF BALLIOL COLLEGE

W. D. ROSS M.A.
FELLOW OF ORIEL COLLEGE

VOLUME VIII

METAPHYSICA

OXFORD
AT THE CLARENDON PRESS
1908

HENRY FROWDE, M.A.
PUBLISHER TO THE UNIVERSITY OF OXFORD
LONDON, EDINBURGH, NEW YORK
TORONTO AND MELBOURNE

GENERAL PREFACE

It was the desire of the late Master of Balliol, Dr. Benjamin Jowett, as formulated in his will, that the proceeds from the sale of his works, the copyright in which he bequeathed to Balliol College, should be used to promote the study of Greek Literature, especially by the publication of new translations and editions of Greek authors. In a codicil to his will he expressed the hope that the translation of Aristotle's works begun by his own translation of the *Politics* should be proceeded with as speedily as possible. The College resolved that the funds thus accruing to them should, in memory of his services to the College and to Greek letters, be applied to the subvention of a series of translations of the works of Aristotle. Through the co-operation, financial and other, of the Delegates of the University Press it has now become possible to begin the realization of this design. By agreement between the College and the Delegates of the Press the present editors were appointed to superintend the carrying out of the scheme. The series, of which the first instalment is now brought before the public, is published at the joint expense and risk of the College and the Delegates of the Press.

The editors have secured the co-operation of various scholars in the task of translation. The translations make no claim to finality, but aim at being such as a scholar might construct in preparation for a critical edition and commentary. The translation will not presuppose any critical reconstitution of the text. Wherever new readings are proposed the fact

will be indicated, but notes justificatory of conjectural emendations or defensive of novel interpretations will, where admitted, be reduced to the smallest compass. The editors, while retaining a general right of revision and annotation, will leave the responsibility for each translation to its author, whose name will in all cases be given.

J. A. S.
W. D. R.

METAPHYSICA

BY

W. D. ROSS

TO

INGRAM BYWATER

PREFACE

WITH the permission of Messrs. Teubner I have followed in this translation the text of W. Christ (Leipzig, 1895). All divergences from his readings have been mentioned in the notes, except that I have frequently left it to the rendering itself to show that I have not followed his punctuation or his excisions. The commentaries of Alexander and Bonitz have been my greatest help; but I owe much also to Bullinger's notes, and to the translation of Book Z, chaps. i–xi, by the late Mr. Richard Shute.

I wish to acknowledge my deep obligations to Mr. Bywater and Prof. Cook Wilson, whose opinions on several difficult passages have been most kindly placed at my disposal; to the members of the Oxford Aristotelian Society, for what I learnt from them during our reading of Books M and N; to Mr. H. H. Joachim, Fellow of Merton College, for the loan of his valuable notes on Books Z, H, and Θ; to Mr. C. Cannan, Secretary to the Delegates of the University Press, and Mr. R. P. Hardie, of Edinburgh University, whose comments on various parts of the work have been of the greatest assistance to me; to my co-editor Mr. J. A. Smith, and to Dr. G. R. T. Ross, who have read the whole book both in manuscript and in proof, and whose suggestions I have adopted in countless passages; and to my wife, who has read the whole book in proof, and has aided me very greatly in points of style.

W. D. R.

CONTENTS

A.

CH.

1. The advance from sensation through memory, experience, and art, to theoretical knowledge.
2. Characteristics of 'wisdom' (philosophy).
3. The successive recognition by earlier philosophers of the material, efficient, and final causes.
4. Inadequacy of the treatment of these causes.
5. The Pythagorean and Eleatic schools; the former recognizes vaguely the formal cause.
6. The Platonic philosophy; it uses only the material and formal causes.
7. The relation of the various systems to the four causes.
8. Criticism of the pre-Platonic philosophers.
9. Criticism of the doctrine of Ideas.
10. The history of philosophy reveals no causes other than the four.

a.

1. General considerations about the study of philosophy.
2. There cannot be an infinite series, nor an infinite variety of kinds, of causes.
3. Different methods are appropriate to different studies.

B.

1. Sketch of the main problems of philosophy.
2. Fuller statement of the problems:—
   - (i) Can one science treat of all the four causes?
   - (ii) Are the primary axioms treated of by the science of substance, and if not, by what science?
   - (iii) Can one science treat of all substances?
   - (iv) Does the science of substance treat also of its attributes?
   - (v) Are there any non-sensible substances, and if so, of how many kinds?
3. (vi) Are the genera, or the constituent parts, of things their first principles?
   - (vii) If the genera, is it the highest genera or the lowest?
4. (viii) Is there anything apart from individual things?
   - (ix) Is each of the first principles one in kind, or in number?
   - (x) Are the principles of perishable and of imperishable things the same?
   - (xi) Are being and unity substances or attributes?
5. (xii) Are the objects of mathematics substances?

CONTENTS

CH.
6. (xiii) Do Ideas exist, as well as sensible things and the objects of mathematics?
(xiv) Do the first principles exist potentially or actually?
(xv) Are the first principles universal or individual?

Γ.

1. Our object is the study of being as such.
2. We must therefore study primary being (viz. substance), unity and plurality, and the derivative contraries, and the attributes of being and of substance.
3. We must study also the primary axioms, and especially the law of contradiction.
4. Fatal difficulties involved in the denial of this law.
5. The connexion of such denial with Protagoras' doctrine of relativity; the doctrine refuted.
6. Further refutation of Protagoras.
7. The law of excluded middle defended.
8. All judgements are not true, nor are all false; all things are not at rest, nor are all in motion.

Δ.

Philosophical Lexicon.

1. 'Beginning.'
2. 'Cause.'
3. 'Element.'
4. 'Nature.'
5. 'Necessary.'
6. 'One.' 'Many.'
7. 'Being.'
8. 'Substance.'
9. 'The same.' 'Other.' 'Different.' 'Like.' 'Unlike.'
10. 'Opposite.' 'Contrary.' 'Other in species.' 'The same in species.'
11. 'Prior.' 'Posterior.'
12. 'Potency.' 'Capable.' 'Incapacity.' 'Incapable.' 'Possible.' 'Impossible.'
13. 'Quantity.'
14. 'Quality.'
15. 'Relative.'
16. 'Complete.'
17. 'Limit.'
18. 'That in virtue of which.' 'In virtue of itself.'
19. 'Disposition.'
20. 'Having' or 'habit' (ἕξις).
21. 'Affection.'
22. 'Privation.'
23. 'Have' or 'hold' (ἔχειν). 'Be in.'
24. 'From.'

CONTENTS

CH.
25. 'Part.'
26. 'Whole.' 'Total.' 'All.'
27. 'Mutilated.'
28. 'Race' or 'genus' (γένος). 'Other in genus.'
29. 'False.'
30. 'Accident.'

E.

1. Distinction of 'theology', the science of being as such, from the other theoretical sciences, mathematics and physics.
2. Four senses of 'being'. Of these (i) accidental being is the object of no science.
3. The nature and origin of accident.
4. (ii) Being as truth is not primary being.

Z.

1. The study of being is primarily the study of substance.
2. Various opinions on the question, what things are substances?
3. Four things are commonly held to be substantial—the essence, the universal, the genus, the substratum. The last may be conceived as matter, form, or the concrete individual. Reasons why *matter* and the *concrete individual* cannot be primary substance. *Form* to be studied first in sensible things.
4. What is essence and to what does it belong, i.e. what things can be defined? Primarily substance.
5. Combinations of a subject with one of its proper attributes have no definition nor essence.
6. Is a thing the same as its essence? Yes, if it is a substance.
7. Analysis of generation, whether by nature, art, or spontaneity.
8. Form is not generated, but put into matter; yet it did not previously exist apart—the agent in generation is form embodied in another individual of the same species.
9. Why spontaneous generation sometimes takes place. The conditions of generation in the categories other than substance.
10. When are definitions of the parts included in the definition of the whole? When the parts are parts of the form.
11. Which parts are parts of the form, which of the concrete individual?
12. Wherein consists the unity of an object of definition? In the appropriateness of the differentia to the genus.
13. A universal cannot be either the substance or an element in the substance of anything (yet how else can a thing be defined?).
14. Hence it is fatal to make Ideas substances and yet hold that they are composed of other Ideas.
15. No individual can be defined, whether sensible or, like the Ideas, intelligible.
16. The parts of sensible things are only potencies. Unity and being are not the substance of things.

CONTENTS

CH.
17. Substance is the cause or form which puts matter into a determinate state; it is that in a thing which is distinct from its material elements.

H.

1. The discussion of sensible substances continued. Their matter is itself substance.
2. The main types of form or actuality. Definitions of matter, of form, and of the concrete individual distinguished.
3. Form distinguished from the material elements; Antisthenes' attack on definition; definition analogous to number.
4. Remote and proximate matter; the substratum of *attributes* not matter but the concrete individual.
5. The relation of matter to its contrary states.
6. What gives unity to a definition? The fact that the genus is simply the potency of the differentia, the differentia the actuality of the genus.

Θ.

1. Being as potency and actuality. Potency in the strict sense, as potency of motion, active or passive.
2. Non-rational potencies are single, rational potencies twofold.
3. Potency defended against the attack of the Megaric school.
4. Potency as possibility.
5. How potency is acquired, and the conditions of its actualization.
6. Actuality distinguished from potency; a special type of potency described; actuality distinguished from movement.
7. When one thing may be called the potency or matter of another; how things are described by names derived from their matter or their accidents.
8. Actuality prior to potency in definition, time, and substantiality; nothing eternal or necessary is a mere potency.
9. Good actuality better than potency, and bad actuality worse; therefore no separate evil principle in the universe. Geometrical truths found by actualization of potencies.
10. Being as truth, with regard to both simple and composite objects.

I.

1. Four kinds of unit; the essence of a unit is to be a measure of quantity or of quality; various types of measure.
2. Unity not a substance but a universal predicate; its denotation the same as that of being.
3. Unity and plurality; identity; likeness; otherness; difference.
4. Contrariety is complete difference; how related to privation and contradiction.
5. The opposition of the equal to the great and the small.
6. The opposition of the one to the many.

CH.
7. Intermediates are homogeneous with each other and with the extremes, stand between contraries, and are compounded out of these contraries.
8. Otherness *in* species is otherness *of* the genus and is contrariety; its nature further described.
9. What contrarieties constitute otherness in species.
10. The perishable and the imperishable differ in kind.

K.

1. Recapitulation of B. 2, 3.
2. „ B. 4–6.
3. „ Γ. 1, 2.
4. „ Γ. 3.
5. „ Γ. 4.
6. „ Γ. 5–8.
7. „ E. 1.
8. „ E. 2–4.

Extracts from *Physics*:

9. II. 5, 6, on luck.
III. 1–3, on potency, actuality, and movement.
10. IV. 4, 5, 7, on the infinite; there is no actual infinite, and especially no infinite body.
11. V. 1, on change and movement.
12. V. 2, 3, on the three kinds of movement.
Definitions of 'together in place', 'apart', 'touch', 'between', 'contrary in place', 'successive', 'contiguous', 'continuous'.

Λ.

1. Substance the primary subject of inquiry. Three kinds of substance—perishable sensible, eternal sensible, and unmovable (non-sensible).
2. Change implies not only form and privation but matter.
3. Neither matter nor form comes into being. Whatever comes into being comes from a substance of the same kind. If form ever exists apart from the concrete individual, it is in the case of natural objects.
4. Different things have elements numerically different but the same in kind; they all have form, privation, and matter. They also have a proximate and an ultimate moving cause.
5. Again actuality and potency are principles common to all things, though they apply differently in different cases. The principles of all things are only analogous, not identical.
6. Since movement must be eternal, there must be an eternal mover, and one whose essence is actuality (actuality being prior to potency). To account for the uniform change in the universe,

CH.

there must be one principle which acts always alike, and one whose action varies.

7. The eternal mover originates motion by being the primary object of desire (as it is of thought); being thoroughly actual, it cannot change or move; it is a living being, perfect, separate from sensible things, and without parts.

8. Besides the first mover there must be as many unmoved movers as there are simple motions involved in the motions of the planets. The number is probably either 49 or 55. As there is but one prime mover, there must be but one heaven.

9. The divine thought must be concerned with the most divine object, which is itself. Thought and the object of thought are never different when the object is immaterial.

10. How the good is present in the universe both as the order of the parts and (more primarily) as their ruler. Difficulties which attend the views of other philosophers.

M.

1. We pass to immaterial substance. Two kinds of immaterial substances have been believed in, mathematical objects and Ideas. We shall discuss first the former, then the latter, then the view that numbers and Ideas are the substance of sensible things.

2. (i) Mathematical objects cannot exist as distinct substances either in or apart from sensible things.

3. They can be separated only in thought. Mathematics is not entirely divorced from consideration of the beautiful, as is sometimes alleged.

4. (ii) Arguments which led to the belief in Ideas. Some prove too little, others too much.

5. Even if there were Ideas, they would not explain the changes in the sensible world.

6. (iii) Various ways in which numbers may be conceived as the substance of things.

7. (*a*) If all units are addible, this gives only mathematical, not ideal number. (*b*) If all units are inaddible, this gives neither mathematical nor ideal number. (*c*) If only the units in the same number are addible, this leads to equal difficulties; units must have no difference of kind.

8. The views of Platonists who disagree with Plato, and those of the Pythagoreans, lead to equal difficulties. Further objections to ideal numbers: (*a*) How are the units derived from the indefinite dyad? (*b*) Is the series of numbers infinite or finite; and if finite, what is its limit? (*c*) What sort of principle is the one?

9. Discussion of the principles of geometrical objects. Criticism of the generation of numbers from unity and plurality, and of spatial

CH.

magnitudes from similar principles. The criticism of ideal numbers summed up. The upholders of Ideas make them at once universal and individual.

10. Are the first principles of substances individual or universal?

N.

1. The principles cannot be contraries. The Platonists in making them contraries treated one of the contraries as matter. Various forms of this theory. The nature of unity and plurality expounded.
2. Eternal substances cannot be compounded out of elements. The object of the Platonists is to explain the presence of plurality in the world, but in this they do not succeed. What justifies the belief in the separate existence of numbers?
3. Difficulties in the various theories of number. The Pythagoreans ascribe generation to numbers, which are eternal.
4. The relation between the first principles and the good.
5. How is number supposed to be derived from its elements? How is it the cause of substances?
6. The causal agency ascribed to numbers is purely fanciful.

Cf Zeller: Arist. etc. ?, 16 (note 2) for the construction of the "Metaphysics".

BOOK I (A)

CHAPTER I

ALL men by nature desire to know. An indication of this 980a is the delight we take in our senses; for even apart from their usefulness they are loved for themselves; and above all others the sense of sight. For not only with a view to action, but even when we are not going to do anything, we prefer sight to almost everything else. The reason is that this, most of all the senses, makes us know and brings to light many differences between things.

By nature animals are born with the faculty of sensation, and from sensation memory is produced in some of them, though not in others. And therefore the former are more 980b intelligent and apt at learning than those which cannot remember; those which are incapable of hearing sounds are intelligent though they cannot be taught, e.g. the bee, and any other race of animals that may be like it; and those which besides memory have this sense of hearing, can be taught.

The animals other than man live by appearances and memories, and have but little of connected experience; but the human race lives also by art and reasonings. And from memory experience is produced in men; for many memories of the same thing produce finally the capacity for a single experience. Experience is almost identified with 981a science and art, but really science and art come to men *through* experience; for 'experience made art', as Polus says,[1] and rightly, 'but inexperience luck.' And art arises, when from many notions gained by experience one universal judgement about a class of objects is produced. For to have a judgement that when Callias was ill of this disease this did him good, and similarly in the case of Socrates and in many individual cases, is a matter of experience; but to

[1] Cf. *Gorgias*, 448 C.

judge that it has done good to all persons of a certain constitution, marked off in one class, when they were ill of this disease, e.g. to phlegmatic or bilious people when burning with fever [1],—this is a matter of art.

With a view to action experience seems in no respect inferior to art, and we even see men of experience succeeding more than those who have theory without experience. The reason is that experience is knowledge of individuals, art of universals, and actions and productions are all concerned with the individual; for the physician does not cure *man*, except in an incidental way, but Callias or Socrates or some other called by some such individual name, who happens to be a man. If, then, a man has the theory without the experience, and knows the universal but does not know the individual included in this, he will often fail to cure; for it is the individual that is to be cured. But yet we think that *knowledge* and *understanding* belong to art rather than to experience, and we suppose artists to be wiser than men of experience (which implies that Wisdom depends in all cases rather on knowledge); and this because the former know the cause, but the latter do not. For men of experience know that the thing is so, but do not know why, while the others know the 'why' and the cause. Hence we think that the master-workers in each craft are more honourable and know in a truer sense and are wiser than the manual workers,
981b because they know the causes of the things that are done [we think the manual workers are like certain lifeless things which act indeed, but act without knowing what they do, as fire burns,—but while the lifeless things perform each of their functions by a natural tendency, the labourers perform them through habit] [2]; thus we view them as being wiser not in virtue of being able to act, but of having the theory for themselves and knowing the causes. And in general it is a sign of the man who knows, that he can teach, and therefore we think art more truly knowledge than experience is; for artists can teach, and men of mere experience cannot.

[1] 981a 12 read χολώδεσι πυρέττουσι καύσῳ (following H. Jackson, *J. of P.* vi. 206).

[2] 981b 2 τοὺς . . . 5 ἔθος is probably a later addition.

Again, we do not regard any of the senses as Wisdom; yet surely these give the most authoritative knowledge of particulars. But they do not tell us the 'why' of anything—e.g. why fire is hot; they only say that it is hot.

At first he who invented any art that went beyond the common perceptions of man was naturally admired by men, not only because there was something useful in the inventions, but because he was thought wise and superior to the rest. But as more arts were invented, and some were directed to the necessities of life, others to its recreation, the inventors of the latter were naturally always regarded as wiser than the inventors of the former, because their branches of knowledge did not aim at utility. Hence when all such inventions were already established, the sciences which do not aim at giving pleasure or at the necessities of life were discovered, and first in the places where men first began to have leisure. This is why the mathematical arts were founded in Egypt; for there the priestly caste was allowed to be at leisure.

We have said in the *Ethics*[1] what the difference is between art and science and the other kindred faculties; but the point of our present discussion is this, that all men suppose what is called Wisdom to deal with the first causes and the principles of things. This is why, as has been said before, the man of experience is thought to be wiser than the possessors of any perception whatever, the artist wiser than the men of experience, the master-worker than the mechanic, and the theoretical kinds of knowledge to be more of the nature of Wisdom than the productive. Clearly then Wisdom is knowledge about 982a
certain causes and principles.

CHAPTER II

Since we are seeking this knowledge, we must inquire of what kind are the causes and the principles, the knowledge of which is Wisdom. If we were to take the notions we have about the wise man, this might perhaps make the answer more evident. We suppose first, then, that the wise man knows all things, as far as possible, although he has not

[1] vi. 3-7.

knowledge of each of them in detail; secondly, that he who can learn things that are difficult, and not easy for man to know, is wise (sense-perception is common to all, and therefore easy and no mark of Wisdom); again, he who is more exact and more capable of teaching the causes is wiser, in every branch of knowledge; and of the sciences, also, that which is desirable on its own account and for the sake of knowing it is more of the nature of Wisdom than that which is desirable on account of its results, and the superior science is more of the nature of Wisdom than the ancillary; for the wise man must not be ordered but must order, and he must not obey another, but the less wise must obey *him*.

Such and so many are the notions, then, which we have about Wisdom and the wise. Now of these characteristics that of knowing all things must belong to him who has in the highest degree universal knowledge; for he knows in a sense all the subordinate objects. And these things, the most universal, are on the whole the hardest for men to know; for they are furthest from the senses. And the most exact of the sciences are those which deal most with first principles; for those which involve fewer principles are more exact than those which involve additional principles, e.g. arithmetic than geometry. But the science which investigates causes is also the more communicable, for the people who teach are those who tell the causes of each thing. And understanding and knowledge pursued for their own sake are found most in the knowledge of that which is most knowable; for he who chooses to know for the sake of knowing will choose most
982b readily that which is most truly knowledge, and such is the knowledge of that which is most knowable; and the first principles and the causes are most knowable; for by reason of these, and from these, all other things are known, but these are not known by means of the things subordinate to them. And the science which knows to what end each thing must be done is the most authoritative of the sciences, and more authoritative than any ancillary science; and this end is the good in each class, and in general the supreme good in the whole of nature. Judged by all the tests we have mentioned, then, the name in question ⟨'Wisdom'⟩ falls to the same

science; this must be a science that investigates the first principles and causes; for the good, i. e. the end and aim, is one of the causes.

That it is not a science of production is clear even from the history of the earliest philosophers. For it is owing to their wonder that men both now begin and at first began to philosophize; they wondered originally at the obvious difficulties, then advanced little by little and stated difficulties about the greater matters, e.g. about the phenomena of the moon and those of the sun, and about the stars and about the genesis of the universe. And a man who is puzzled and wonders thinks himself ignorant (whence even the lover of myth is in a sense a lover of Wisdom, for the myth is composed of wonders); therefore since they philosophized in order to escape from ignorance, evidently they were pursuing science in order to know, and not for any utilitarian end. And this is confirmed by the facts; for it was when almost all the necessities of life and the things that make for comfort and recreation were present, that such knowledge began to be sought. Evidently then we do not seek it for the sake of any other advantage; but as the man is free, we say, who exists for himself and not for another, so we pursue this as the only free science,[1] for it alone exists for itself.

Hence the possession of it might be justly regarded as beyond human power; for in many ways human nature is in bondage, so that according to Simonides[2] 'God alone can have this privilege', and it is unfitting that man should not be content to seek the knowledge that is suited to him. If, then, there is something in what the poets say, and jealousy is natural to the divine power, it would probably occur in this 983a
case above all, and all who excelled in this knowledge would be unfortunate. But the divine power cannot be jealous (nay, according to the proverb,[3] 'bards tell many a lie'), nor should any science be thought more honourable than one of this sort. For the most divine science is also most honourable; and this science alone is, in two ways, most divine. For the

[1] 982b 26 read *αὐτὴν ὡς μόνην οὖσαν ἐλευθέραν.*
[2] Fr. 3 Hiller.
[3] Solon, fr. 26 Hiller.

science which it would be most meet for God to have is a divine science, and so is any science that deals with divine objects; and this science alone has both these qualities; for (1) God is thought to be among the causes of all things and to be a first principle, and (2) such a science either God alone can have, or God above all others. All the sciences, indeed, are more necessary than this, but none is better.

Yet the acquisition of it must in a sense end in something which is the opposite of our original inquiries. For all men begin, as we said, by wondering that the matter is so (as those who have not yet perceived the explanation marvel at automatic marionettes)—whether the object of their wonder be the solstices or the incommensurability of the diagonal of a square with the side; for it seems wonderful to all men that there is a thing which cannot be measured even by the smallest unit. But we must end in the contrary and, according to the proverb, the better state, as is the case in these instances when men learn the cause; for there is nothing which would surprise a geometer so much as if the diagonal turned out to be commensurable.

We have stated, then, what is the nature of the science we are searching for, and what is the mark which our search and our whole investigation must reach.

CHAPTER III

Evidently we have to acquire knowledge of the original causes (for we say we know each thing only when we think we recognize its first cause), and causes are spoken of in four senses. In one of these we mean the substance, i.e. the essence (for the 'why' is reducible finally to the formula, and the ultimate 'why' is a cause and principle); in another the matter or substratum, in a third the source of the change, and in a fourth the cause opposed to this, the purpose and the good (for this is the end of all generation and change). We have studied these causes sufficiently in our work on nature,[1]
983b but yet let us call to our aid those who have attacked the

[1] *Phys.* ii. 3, 7.

investigation of being and philosophized about reality before us. For obviously they too speak of certain principles and causes ; to go over their views, then, will be of profit to the present inquiry, for we shall either find another kind of cause, or be more convinced of the correctness of those which we now maintain.

Of the first philosophers, most thought the principles which were of the nature of matter were the only principles of all things ; that of which all things that are consist, and from which they first come to be, and into which they are finally resolved (the substance remaining, but changing in its modifications), this they say is the element and the principle of things, and therefore they think nothing is either generated or destroyed, since this sort of entity is always conserved, as we say Socrates neither comes to be absolutely when he comes to be beautiful or musical, nor ceases to be when he loses these characteristics, because the substratum, Socrates himself, remains. So they say nothing else comes to be or ceases to be ; for there must be some entity—either one or more than one—from which all other things come to be, it being conserved.

Yet they do not all agree as to the number and the nature of these principles. Thales, the founder of this school of philosophy, says the principle is water (for which reason he declared that the earth rests on water), getting the notion perhaps from seeing that the nutriment of all things is moist, and that heat itself is generated from the moist and kept alive by it (and that from which they come to be is a principle of all things). He got his notion from this fact, and from the fact that the seeds of all things have a moist nature, and that water is the origin of the nature of moist things.

Some think that the ancients who lived long before the present generation, and first framed accounts of the gods, had a similar view of nature ; for they made Ocean and Tethys the parents of creation, and described the oath of the gods as being by water, which the poets themselves call Styx ; for what is oldest is most honourable, and the most honourable thing is that by which one swears. It may perhaps be uncertain whether this opinion about nature is primitive and 984a
ancient, but Thales at any rate is said to have declared him-

self thus about the first cause. Hippo no one would think fit to include among these thinkers, because of the paltriness of his thought.

Anaximenes and Diogenes make air prior to water, and the most primary of the simple bodies, while Hippasus of Metapontium and Heraclitus of Ephesus say this of fire, and Empedocles says it of the four elements, adding a fourth—earth—to those which have been named; for these, he says, always remain and do not come to be, except that they come to be more or fewer, being aggregated into one and segregated out of one.

Anaxagoras of Clazomenae, who, though older than Empedocles, was later in his philosophical activity, says the principles are infinite in number; for he says almost all the things that are made of parts like themselves are generated and destroyed (as water or fire is) only by aggregation and segregation, and are not in any other sense generated or destroyed, but remain eternally.

From these facts one might think that the only cause is the so-called material cause; but as men thus advanced, the very facts showed them the way and joined in forcing them to investigate the subject. However true it may be that all generation and destruction proceed from some one or more elements, why does this happen and what is the cause? For at least the substratum itself does not make itself change; e.g. neither the wood nor the bronze causes the change of either of them, nor does the wood manufacture a bed and the bronze a statue, but something else is the cause of the change. And to seek this is to seek the second cause, as *we* should say,—that from which comes the beginning of the movement. Now those who at the very beginning set themselves to this kind of inquiry, and said the substratum was one, were not at all dissatisfied with themselves; but some at least of those who maintain it to be one—as though defeated by this search for the second cause—say the one and nature as a whole is unchangeable not only in respect of generation and destruction (for this is a primitive belief, and all agreed in it), but also of all other change; and this view is peculiar to them.
984b Of those who said the universe was one, none succeeded in

discovering a cause of this sort, except perhaps Parmenides, and he only insomuch that he supposes that there is not only one but in some sense two causes. But for those who make more elements it is more possible to state the second cause, e.g. for those who make hot and cold, or fire and earth, the elements; for they treat fire as having a nature which fits it to move things, and water and earth and such things they treat in the contrary way.

When these men and the principles of this kind had had their day, as the latter were found inadequate to generate the nature of things, men were again forced by the truth itself, as we said, to inquire into the next kind of cause. For surely it is not likely either that fire or earth or any such element should be the reason why things manifest goodness and beauty both in their being and in their coming to be, or that those thinkers should have supposed it was; nor again could it be right to ascribe so great a matter to spontaneity and luck. When one man said, then, that reason was present—as in animals, so throughout nature—as the cause of the world and of all its order, he seemed like a sober man in contrast with the random talk of his predecessors. We know that Anaxagoras certainly adopted these views, but Hermotimus of Clazomenae is credited with expressing them earlier. Those who thought thus stated that there is a principle of things which is at the same time the cause of beauty, and that sort of cause from which things acquire movement.

CHAPTER IV

One might suspect that Hesiod was the first to look for such a thing—or some one else who put love or desire among existing things as a principle, as Parmenides does; for he, in constructing the genesis of the universe, says[1]:—

Love first of all the Gods she planned.

And Hesiod says[2]:—

First of all things was chaos made, and then
Broad-breasted earth, and love that foremost is
Among all the immortals,

[1] Fr. 13, Diels, *Vorsokratiker*. [2] *Theog.* 116.

which implies that among existing things there must be from the first a cause which will move things and bring them together. How these thinkers should be arranged with regard to priority of discovery let us be allowed to decide later; but since the contraries of the various forms of good were also perceived to be present in nature—not only order and the beautiful, but 985a also disorder and the ugly, and bad things in greater number than good, and ignoble things than beautiful, therefore another thinker introduced friendship and strife, each of the two the cause of one of these two sets of qualities. For if we were to follow out the view of Empedocles, and interpret it according to its meaning and not to its lisping expression, we should find that friendship is the cause of good things, and strife of bad. Therefore, if we said that Empedocles in a sense both mentions, and is the first to mention, the bad and the good as principles, we should perhaps be right, since the cause of all goods is the good itself.

These thinkers, as we say, evidently grasped, and to this extent, two of the causes which we distinguished in our work on nature[1]—the matter and the source of the movement,—vaguely, however, and with no clearness, but as untrained men behave in fights; for they go round their opponents and often strike fine blows, but they do not fight on scientific principles, and so these thinkers do not seem to know what they say; for it is evident that, as a rule, they make no use of their causes except to a small extent. For Anaxagoras uses reason as a *deus ex machina* for the making of the world, and when he is at a loss to tell for what cause something necessarily is, then he drags reason in, but in all other cases ascribes events to anything rather than to reason[2]. And Empedocles, though he uses the causes to a greater extent than this, neither does so sufficiently nor attains consistency in their use. At least, in many cases he makes friendship segregate things, and strife aggregate them. For when the universe is dissolved into its elements by strife, fire is aggregated into one, and so is each of the other elements; but when again under the influence of friendship they come together into one, the parts must again be segregated out of each element.

[1] *Phys.* ii. 3, 7. [2] Cf. Diels, *Vorsokratiker*, ed. 2, p. 303. 42.

Empedocles, then, in contrast with his predecessors, was the first to introduce this cause in a divided form, not positing one source of movement, but different and contrary sources. Again, he was the first to speak of four material elements; yet he does not *use* four, but treats them as two only; he treats fire 985b by itself, and its opposites—earth, air, and water—as one kind of thing. We may learn this by study of his verses.

This philosopher then, as we say, spoke of the principles in this way, and made them of this number. Leucippus and his associate Democritus say that the full and the empty are the elements, calling the one being and the other non-being—the full and solid being being, the empty and the rare non-being (whence they say being is no more being than non-being is, because the solid is no more being than the empty[1]); and they make these the material causes of things. And as those who make the underlying substance one generate all other things by its modifications, supposing the rare and the dense to be the sources of the modifications, in the same way these philosophers say the differences in the elements are the causes of all other qualities. These differences, they say, are three—shape and order and position. For they say the real is differentiated only by 'rhythm' and 'inter-contact' and 'turning'; and of these rhythm is shape, inter-contact is order, and turning is position; for A differs from N in shape, AN from NA in order, ⌶ from H in position.[2] The question of movement—whence or how it belongs to things—these thinkers, like the others, lazily neglected.

Regarding the two causes, then, as we say, the inquiry seems to have been pushed thus far by the early philosophers.

CHAPTER V

Contemporaneously with these philosophers and before them, the Pythagoreans, as they are called, devoted themselves to mathematics; they were the first to advance this study,[3] and

[1] 985b 9 read οὐδὲ τοῦ κενοῦ τὸ σῶμα. So perhaps Alexander.

[2] 985b 18 read τὸ δὲ ⌶ τοῦ H θέσει. Cf. Gomperz, *Greek Thinkers*, i. 568.

[3] 985b 24 read πρῶτοι ταῦτα προήγαγον.

having been brought up in it they thought its principles were the principles of all things. Since of these principles numbers are by nature the first, and in numbers they seemed to see many resemblances to the things that exist and come into being—more than in fire and earth and water (such and such a modification of numbers being justice, another being soul and reason, another being opportunity—and similarly almost all other things being numerically expressible[1]); since, again, they saw that the attributes and the ratios of the musical scales were expressible in numbers; since, then, all other things seemed in their whole nature to be modelled after numbers, and numbers seemed to be the first things in the whole of
986a nature, they supposed the elements of numbers to be the elements of all things, and the whole heaven to be a musical scale and a number. And all the properties of numbers and scales which they could show to agree with the attributes and parts and the whole arrangement of the heavens, they collected and fitted into their scheme; and if there was a gap anywhere, they readily made additions so as to make their whole theory coherent. E.g. as the number 10 is thought to be perfect and to comprise the whole nature of numbers, they say that the bodies which move through the heavens are ten, but as the visible bodies are only nine, to meet this they invent a tenth—the 'counter-earth'. We have discussed these matters more exactly elsewhere.[2]

But the object of our discussion is that we may learn from these philosophers also what they suppose to be the principles and how these fall under the causes we have named. Evidently, then, these thinkers also consider that number is the principle both as matter for things and as forming their modifications and their permanent states, and hold that the elements of number are the even and the odd, and of these the former is unlimited, and the latter limited; and the 1 proceeds from both of these (for it is both even and odd), and number from the 1; and the whole heaven, as has been said, is numbers.

Other members of this same school say there are ten

[1] Cf. Diels, *Vorsokratiker*, ed. 2, p. 235, § 12.

[2] *De Coelo*, ii. 13; Fr. *de Pythagoreis*, ii. 1513a 35–b 20. Cf. Diels, *ibid.* p. 270. 48.

principles, which they arrange in two columns of cognates[1]—limit and unlimited, odd and even, one and plurality, right and left, male and female, resting and moving, straight and curved, light and darkness, good and bad, square and oblong. In this way Alcmaeon of Croton seems also to have conceived the matter, and either he got this view from them or they got it from him; for he expressed himself similarly[2] to them. For he says most human affairs go in pairs, meaning not definite contrarieties such as the Pythagoreans speak of, but any chance contrarieties, e.g. white and black, sweet and bitter, good and bad, great and small. He threw out indefinite suggestions about the other contrarieties, but the Pythagoreans 986b
declared both how many and which their contrarieties are.

From both these schools, then, we can learn this much, that the contraries are the principles of things; and how many these principles are and which they are, we can learn from one of the two schools. But how these principles can be brought together under the causes we have named has not been clearly and articulately stated by them; they seem,

[1] συστοιχία and σύστοιχος are used in a great variety of connexions by Aristotle, but the common notion is that of things which from some point of view may be treated as forming one line or column. The meanings in the *Metaphysics* may be summarized thus:—

In A. 986a 23, N. 1093b 12 the reference is to a Pythagorean classification of important general notions. The first column is the line of good (ἡ συστοιχία ἡ τοῦ καλοῦ, N. 1093b 12), the second the line of evil. To the line of good N. 1093b 13 adds 'the equal and the powers of certain numbers'.

In Γ. 1004b 27, K. 1066a 15, Λ. 1072a 31 there is no explicit reference to the Pythagorean doctrine, but Aristotle speaks of two 'lines', one of which is 'knowable in itself', while the other is 'privative', and its 'principles' are 'indefinite because they are privative'.

In I. 1054b 35, 1058a 13 we have a different sort of line. Terms which in the strict sense 'differ' are said to be either different in genus or in the same line of predication, and therefore in the same genus; and contraries which differ in species and not in genus are said to be in the same line of predication. συστοιχία τῆς κατηγορίας seems to correspond to σχῆμα τῆς κατηγορίας (1054b 29), which is said in Δ. 1016b 33 to be coextensive with a γένος. It is surprising to find genus identified with category, and one is tempted to suggest that συστοιχία (or σχῆμα) τῆς κατηγορίας means one of the main *divisions of a category*, within which the same sort of predicate is found. Thus number would be the genus within which the predicates odd and even, and various subordinate predicates, are found. Then the subordinate predicates may be thought of as forming a column under 'odd and even.' But Δ. 1024b 12–16 shows that genus in one sense *can* be identified with category. The categories are the only genera proper, since they are the only genera which are not species.

[2] 986a 29 omit ἐγένετο τὴν ἡλικίαν, ἐπὶ γέροντι Πυθαγόρᾳ, and δέ.

however, to range the elements under the head of matter; for out of these as immanent parts they say substance is composed and moulded.[1]

From these facts we may sufficiently perceive the meaning of the ancients who said the elements of nature were more than one; but there are some who spoke of the universe as if it were one entity, though they were not all alike either in the excellence of their statement or in regard to the nature of the entity. The discussion of them is in no way appropriate to our present investigation of causes, for they do not, like some of the natural philosophers, assume being to be one and yet generate it out of the one as out of matter, but they speak in another way; those others add change, since they generate the universe, but these thinkers say the universe is unchangeable. Yet this much is appropriate to the present inquiry: Parmenides seems to fasten on that which is one in formula, Melissus on that which is one in matter, for which reason the former says that it is limited, the latter that it is unlimited[2]; while Xenophanes, the first of this school of monists (for Parmenides is said to have been his pupil), gave no clear statement, nor does he seem to have grasped either of these two kinds of unity, but he contemplates the whole heaven and says the One is, namely God. Now these thinkers, as we said, must be neglected for the purposes of the present inquiry—two of them entirely, as being a little too naïve, viz. Xenophanes and Melissus; but Parmenides seems to speak with somewhat more insight. For, claiming that, besides the existent, nothing non-existent exists, he thinks that the existent is of necessity one and that nothing else exists (on this we have spoken more clearly in our work on nature)[3], but being forced to follow the observed facts, and supposing the existence of that which is one in formula, but more than one according to our sensations, he now posits two causes and two principles, calling them hot and cold, i.e. fire and earth;
987a and of these he ranges the hot with the existent, and the other with the non-existent.[4]

From what has been said, then, and from the wise men who

[1] Cf. Philolaus, Fr. 2, 5, 6 Diels, *Vorsokratiker*.
[2] Cf. *ibid.* p. 142. 20.
[3] *Phys.* i. 3.
[4] Cf. Γ. 1010a 1.

have now sat in council with us, we have got thus much—both from the earliest philosophers, who regard the first principle as corporeal (for water and fire and such things are bodies), and of whom some suppose that there is one corporeal principle, others that there are more than one, but both put these under the head of matter; and from some others who posit both this cause and besides this the source of movement, which is stated by some as one and by others as two.

Down to the Italian school, then, and apart from it, philosophers have treated these subjects rather obscurely[1], except that, as we said, they have used two kinds of cause, and one of these—the source of movement—some treat as one and others as two. But the Pythagoreans have said in the same way that there are two principles, but added this much, which is peculiar to them, that they thought finitude and infinity and unity were not attributes of certain other things, e.g. of fire or earth or anything else of this kind, but that infinity itself and unity itself were the substance of the things of which they are predicated. This is why number was the substance of all things. On this subject, then, they expressed themselves thus; and regarding the question of essence they began to make statements and definitions, but treated the matter too simply. For they both defined superficially and thought that the first subject of which a given term would be predicable, was the substance of the thing, as if one supposed that 'double' and '2' were the same, because 2 is the first thing of which 'double' is predicable. But surely to be double and to be 2 are not the same; if they are, one thing will be many[2]—a consequence which they actually drew.[3] From the earlier philosophers, then, and from their successors we can learn thus much.

CHAPTER VI

After the systems we have named came the philosophy of Plato, which in most respects followed these thinkers,

[1] 987a 10 read μορυχώτερον.
[2] i. e. 2 will be identified with each even number.
[3] e.g. as friendship was 4, and 4 was the first square number, friendship was identified with each square number.

but had peculiarities that distinguished it from the philosophy of the Italians. For, having in his youth first become familiar with Cratylus and with the Heraclitean doctrines (that all sensible things are ever in a state of flux and there is no knowledge about them), these views he held even in later years.
987b Socrates, however, was busying himself about ethical matters and neglecting the world of nature as a whole but seeking the universal in these ethical matters, and fixed thought for the first time on definitions; Plato accepted his teaching, but held that the problem applied not to any sensible thing but to entities of another kind—for this reason, that the common definition could not be a definition of any sensible thing, as they were always changing. Things of this other sort, then, he called Ideas, and sensible things, he said, were apart from these, and were all called after these; for the multitude of things which have the same name as the Form exist by participation in it. Only the name 'participation' was new; for the Pythagoreans say that things exist by 'imitation' of numbers, and Plato says they exist by participation, changing the name. But what the participation or the imitation of the Forms could be they left an open question.

Further, besides sensible things and Forms he says there are the objects of mathematics, which occupy an intermediate position, differing from sensible things in being eternal and unchangeable, from Forms in that there are many alike, while the Form itself is in each case unique.

Since the Forms are the causes of all other things, he thought their elements were the elements of all things. As matter, the great and the small were principles; as essential reality, the One; for from the great and the small, by participation in the One, come the Forms—i.e. the Numbers.

But he agreed with the Pythagoreans in saying that the One is substance and not a predicate of something else; and in saying that the Numbers are the causes of the reality of other things, he also agreed with them; but positing a dyad and constructing the infinite out of great and small, instead of treating the infinite as one, is peculiar to him; and so is his view that the Numbers exist apart from sensible things, while *they* say that the things themselves are Numbers, and do not

place the objects of mathematics between Ideas and sensible things. His divergence from the Pythagoreans in making the One and the Numbers separate from things, and his introduction of the Forms, were due to his inquiries in the region of definitory formulae (for the earlier thinkers had no tincture of dialectic), and his making the other entity besides the One a dyad was due to the belief that the numbers, except those which were prime,[1] could be neatly produced out of the dyad as out of a plastic material.

Yet what happens is the contrary; the theory is not a reason- 988a
able one. For they make many things out of the matter, and the form generates only once, but what we observe is that one table is made from one matter, while the man who applies the form, though he is one, makes many tables. And the relation of the male to the female is similar; for the latter is impregnated by one copulation, but the male impregnates many females; yet these are analogues of those first principles.

Plato, then, declared himself thus on the points in question; it is evident from what has been said that he has used only two causes, that of the essence and the material cause (for the Forms are the cause of the essence of all other things, and the One is the cause of the essence of the Forms); and it is evident what the underlying matter is, of which the Forms are predicated in the case of sensible things, and the One in the case of Forms, viz. that this is a dyad, the great and the small. Further, he has assigned the cause of good and that of evil to the elements, one to each of the two, as we say[2] some of his predecessors sought to do, e.g. Empedocles and Anaxagoras.

CHAPTER VII

Our account of those who have spoken about first principles and reality and of the way in which they have spoken, has been

[1] This is not quite accurate. Really it is only powers of 2 that could be neatly produced out of this 1 and the indefinite dyad; cf. N. 1091a 9. In *Parmenides* 143 C–144 A 3 is derived from 1 and 2 (the number 2, not, as Aristotle says, the indefinite 2) by addition, and the numbers higher than 3 are derived from 2 and 3 by multiplication. Primes are not there excepted; Plato speaks as if all the higher numbers could be got by multiplication. Nothing in the works of Plato corresponds exactly to what Aristotle says here.

[2] Cf. 984b 18, 985a 4.

concise and summary; but yet we have learnt this much from them, that of those who speak about 'principle' and 'cause' no one has mentioned any principle except those which have been distinguished in our work on nature,[1] but all evidently have some inkling of *them*, though only vaguely. For some speak of the first principle as matter, whether they suppose one or more first principles, and whether they suppose this to be a body or to be incorporeal; e. g. Plato spoke of the great and the small, the Italians of the infinite, Empedocles of fire, earth, water, and air, Anaxagoras of the infinity of things composed of similar parts. These, then, have all had a notion of this kind of cause, and so have all who speak of air or fire or water, or something denser than fire and rarer than air; for some have said the prime element is of this kind.[2] These thinkers grasped this cause only; but certain others have mentioned the source of movement, e. g. those who make friendship and strife, or reason, or love, a principle.

The essence, i. e. the substantial reality, no one has expressed distinctly. It is mentioned chiefly by those who believe in
988b the Forms; for they do not suppose either that the Forms are the matter of sensible things, and the One the matter of the Forms, or that they are the source of movement (for they say these are causes rather of immobility and of being at rest), but they furnish the Forms as the essence of every other thing, and the One as the essence of the Forms.

That which is the end for which actions and changes and movements take place, they assert to be a cause in a way, but not in this way, i. e. not in the way in which it is its *nature* to be a cause. For those who speak of reason or friendship class these causes as goods; they do not speak, however, as if anything that exists either existed or came into being for the sake of these, but as if movements started from these. In the same way those who say the One or the existent is the good, say that it is the cause of substance, but not that substance either is or comes to be for the sake of this. Therefore it turns out that in a sense they both say and do not say the good is a cause; for they do not call it a cause *qua* good but only incidentally.

[1] *Phys.* ii. 3, 7. [2] Cf. Diels, *Vorsokratiker*, ed. 2, pp. 15. 4, 327. 28.

All these thinkers, then, as they cannot pitch on another cause, seem to testify that we have determined rightly both how many and of what sort the causes are. Besides this it is plain that when the causes are being looked for, either all four must be sought thus or they must be sought in one of these four ways. Let us next discuss the possible difficulties with regard to the way in which each of these thinkers has spoken, and with regard to his views about the first principles.

CHAPTER VIII

Those, then, who say the universe is one and posit one kind of thing as matter, and as corporeal matter which has spatial magnitude, evidently go astray in many ways. For they posit the elements of bodies only, not of incorporeal things, though there are incorporeal things. And in trying to state the causes of generation and destruction, and in giving an account of the nature of all things, they do away with the cause of movement. Further, they err in not positing the substance, i. e. the essence, as the cause of anything, and besides this in[1] lightly calling any of the simple bodies except earth the first principle, without inquiring how they are produced out of one another,—I mean fire, water, earth, and air. For some things are produced out of others by combination, others by separation, and this makes the greatest difference to their priority and posteriority. For (1) in a way the property of being most elementary of all would seem to belong to the first thing from which they are produced by combination, and *this* property would belong to 989a
the most fine-grained and subtle of bodies. Therefore those who make fire the principle would be most in agreement with this argument. But each of the other thinkers agrees that the element of corporeal things is of this sort. At least none of the later philosophers who said the world was one claimed that earth was the element, evidently because of the coarseness of its grain. (Of the other three elements each has found some judge on its side; for some maintain that fire, others that water, others that air is the element. Yet why, after all, do they not name earth also, as most men do—for people say all

[1] 988b 28–29 read τῷ γῆν . . . τῷ ῥᾳδίως. Cf. I. Bywater in *J. of P.* xxviii. 246.

things are earth. And Hesiod says[1] earth was produced first of corporeal things; so ancient and popular has the opinion been.) According to this argument, then, no one would be right who either says the first principle is any of the elements other than fire, or supposes it to be denser than air but rarer than water. But (2) if that which is later in generation is prior in nature, and that which is concocted and compounded is later in generation, the contrary of what we have been saying must be true,—water must be prior to air, and earth to water.

Let this suffice, then, as our statement about those who posit one cause such as we mentioned; but the same is true if we suppose more of these, as Empedocles says the matter of things is four bodies. For he too is confronted by consequences some of which are the same as have been mentioned, while others are peculiar to him. For we see these bodies produced from one another, which implies that the same body does not always remain fire or earth (we have spoken about this in our works on nature[2]); and regarding the moving cause and the question whether we must suppose one or two, he must be thought to have spoken neither correctly nor altogether plausibly. [And in general those who speak in this way must do away with change of quality, for on their view cold will not come from hot nor hot from cold. For if it did there would be something that accepted those very contraries, and there would be some one entity that became fire and water, which Empedocles denies.[3]]

As regards Anaxagoras, if one were to suppose that he said there were two elements, the supposition would accord thoroughly with a view which Anaxagoras himself did not state articulately, but which he must have accepted if any one had developed his view. True, to say that in the beginning all things were mixed is absurd both on other grounds and because it follows that they must have existed before in an unmixed
989b form, and because nature does not allow any chance thing to be mixed with any chance thing, and also because on this view

[1] *Theog.* 116.
[2] *De Caelo*, iii. 7; *De Gen. et Corr.* ii. 6.
[3] Ll. 26–30 are probably a gloss.

modifications and accidents could be separated from substances (for the same things which are mixed can be separated); yet if one were to follow him up, piecing together what he means, he would perhaps be seen to be somewhat modern in his views. For when nothing was separated out, evidently nothing could be truly asserted of the substance that then existed. I mean, e.g. that it was neither white nor black, nor grey nor any other colour, but of necessity colourless; for if it had been coloured, it would have had one of these colours. And similarly, by this same argument, it was flavourless, nor had it any similar attribute; for it could not be either of any quality or of any size, nor could it be any definite kind of thing. For if it were, one of the particular forms would have belonged to it, and this is impossible, since all were mixed together; for the particular form would necessarily have been already separated out, but he says all were mixed except mind, and this alone was unmixed and pure.[1] From this it follows, then, that he must say the principles are the One (for this is simple and unmixed) and the Other, which is of such a nature as we suppose the indefinite to be before it is defined and partakes of some form. Therefore, while expressing himself neither rightly nor clearly, he means something like what the later thinkers say and what is now more clearly seen to be the case.[2]

But these thinkers are, after all, at home only in arguments about generation and destruction and movement; for it is practically only of this sort of substance that they seek the principles and the causes. But those who extend their vision to all things that exist, and of existing things suppose some to be perceptible and others not perceptible, evidently study both classes, which is all the more reason why one should devote some time to seeing what is good in their views and what bad from the stand-point of the inquiry we have now before us.

The 'Pythagoreans' treat the principles and the elements more strangely[3] than the physical philosophers (the reason is that they got the principles from non-sensible things, for the

[1] Fr. 12, Diels, *Vorsokratiker*.
[2] 989b 20 read *τοῖς νῦν φαινομένοις μᾶλλον*.
[3] 989b 30 read *ἐκτοπωτέρως*.

objects of mathematics, except those of astronomy, are of the class of things without movement); yet their discussions and investigations are all about nature; for they generate the
990a heavens, and with regard to their parts and attributes and functions they observe the phenomena, and use up the principles and the causes in explaining these, which implies that they agree with the others, the physical philosophers, that the real is just all that which is perceptible and contained by the so-called 'heavens'. But the causes and the principles which they mention are, as we said, sufficient to act as steps even up to the higher realms of reality, and are more suited to these than to theories about nature. They do not tell us at all, however, how there can be movement if limit and unlimited and odd and even are the only things assumed, or how without process and change there can be generation and destruction, or how the bodies that move through the heavens can do what they do. Further, if we either granted them that spatial magnitude consists of these elements, or this were proved, still how would some bodies be light and others have weight? To judge from what they assume and maintain, they speak no more of mathematical bodies than of perceptible; hence they have said nothing whatever about fire or earth or the other bodies of this sort, I suppose because they have nothing to say which applies *peculiarly* to perceptible things.

Further, how are we to combine the beliefs that the modifications of number, and number itself, are causes of what exists and happens in the heavens both from the beginning and now, and that there is no other number than this number out of which the world is composed? When in one particular region they place opinion and opportunity, and, a little above or below, injustice and sifting or mixture, and allege as proof of this that each one of these is a number, but when there happens to be already in each place[1] a plurality of the extended bodies composed of numbers, because these modifications of number attach to the various groups of places,—this being so, is this number, which we must

[1] 990a 25, 26 omit μέν and read συμβαίνῃ . . . τόπον ἤδη.

suppose each of these abstractions to be, the same number which is exhibited in the material universe, or is it another than this? Plato says it is different; yet even he thinks that both these bodies and their causes are numbers, but that the *intelligible* numbers are causes, while the others are *sensible*.

CHAPTER IX

Let us leave the Pythagoreans for the present; for it is enough to have touched on them as much as we have done. But as for those who posit the Ideas as causes, firstly, in seeking to grasp the causes of the things around us, they introduced 990b
others equal in number to these, as if a man who wanted to count things thought he could not do it while they were few, but tried to count them when he had added to their number. For the Forms are practically equal to or not fewer than the things, in trying to explain which these thinkers proceeded from them to the Forms. For to each set of substances there answers a Form which has the same name and exists apart from the substances, and so also in the case of all other groups[1] in which there is one character common to many things, whether the things are in this changeable world or are eternal.

Further, of the ways in which we[2] prove that the Forms exist, none is convincing; for from some no inference necessarily follows, and from some it follows that there are Forms of things of which we think there are no Forms.

For according to the arguments from the existence of the sciences there will be Forms of all things of which there are sciences, and according to the argument that there is one attribute common to many things there will be Forms even of negations, and according to the argument that there is an object for thought even when the thing has perished, there will be Forms of perishable things; for we can have an image of these.

Further, of the more accurate arguments, some lead to Ideas of relations, of which we say there is no independent class, and others involve the difficulty of the 'third man'.[3]

[1] 990b 7 read τῶν τε ἄλλων. [2] Aristotle speaks as a Platonist.
[3] Cf. K. 1059b 8 and Plato *Parm.* 131 E.

And in general the arguments for the Forms destroy the things for whose existence those who maintain[1] the Forms are more anxious than for the existence of the Ideas; for it follows that not the dyad[2] but number is first, i.e. that the relative is prior to the absolute,[3]—besides all the other points on which certain people by following out the opinions held about the Ideas have come into conflict with the principles of the theory.

Further, according to the assumption on which our belief in the Ideas rests, there will be Forms not only of substances but also of many other things (for the concept is single not only in the case of substances but also in the other cases, and there are sciences not only of substance but also of other things, and a thousand other such conclusions also follow). But according to the necessities of the case and the opinions held about the Forms, if they can be shared there must be Ideas of substances only. For they are not shared incidentally, but a thing must share in its Form as in something not predicated of a subject (e.g. if a thing shares in 'double itself', it shares also in 'eternal', but incidentally; for 'eternal' happens to be predicable of the 'double'). Therefore the Forms will be substance; and the same terms indicate substance in this and in the ideal world (or what will be the meaning of saying that there is something apart from the particulars—the one over many?).[4] And if the Ideas and the particulars that share them have the same Form, there will be something common to these; for why should '2' be one[5] and the same in the perishable 2's or in those which are many but eternal, and not the same in the '2 itself' as in the particular 2? But if they have not the same Form, they must have only the name in common, and it is as if one were to call both Callias and a wooden image a 'man', without observing any community between them.[6]

[1] 990^{b} 18 read βούλονται.

[2] Sc. the 'indefinite 2' which Plato held to be one of the first principles of number.

[3] i.e. number, which is relative, is prior to the indefinite 2, which Plato held to be an absolute first principle.

[4] This seems to be an enthymeme, the conclusion to be supplied being that the Forms, since they are substances, must be *of* substances.

[5] 991^{a} 5 omit εἶναι.

[6] With 990^{a} 34–991^{b} 8 cf. M. 1078^{b} 32–1079^{b} 3.

Above all one might discuss the question what on earth the Forms contribute to sensible things, either to those that are eternal or to those that come into being and cease to be. For they cause neither movement nor any change in them. But again they help in no wise towards the *knowledge* of the other things (for they are not even the substance of these, else they would have been in them), nor towards their being, if they are not *in* the particulars which share in them; though if they were, they might be thought to be causes, as white causes whiteness in that with which it is mixed. But this argument, which first Anaxagoras and later Eudoxus and certain others used, is too easily upset; for it is not difficult to collect many insuperable objections to such a view.

But further all other things cannot come from the Forms in any of the usual senses of 'from'. And to say that they are patterns and the other things share them is to use empty words and poetical metaphors. For what is it that works, looking to the Ideas? Anything can either be, or become, like another without being copied from it, so that whether Socrates exists or not a man might come to be like Socrates; and evidently this might be so even if Socrates were eternal. And according to the Platonist's principles there will be several patterns of the same thing, and therefore several Forms, e.g. 'animal' and 'two-footed' and also 'man himself' will be Forms of man. Again, the Forms are patterns not only of sensible things, but of things-in-themselves also, i.e. the genus as genus is the pattern of the species; therefore the same thing will be pattern and copy.

Again it must be held to be impossible that the substance 991b
and that of which it is the substance should exist apart; how, therefore, can the Ideas, being the substances of things, exist apart?

In the *Phaedo*[1] the case is stated in this way—that the Forms are causes both of being and of becoming; yet when the Forms exist, still the things that share in them do not come into being, unless there is some efficient cause; and many other things come into being (e.g. a house or a ring), of which we say there are no Forms. Clearly, therefore,

[1] 100 D.

even the other things can both be and come into being owing to such causes as produce the things just mentioned.[1]

Again, if the Forms are numbers, how can they be causes? Is it because existing things are other numbers, e.g. one number is man, another is Socrates, another Callias? Why then are the one set of numbers causes of the other set? It will not make any difference even if the former are eternal and the latter are not. But if it is because things in this sensible world (e.g. harmony) are ratios of numbers, evidently there is some one class of things of which they are ratios. If, then, this—the matter—is some definite thing, evidently the numbers themselves too will be ratios of something to something else. E.g. if Callias is a numerical ratio between fire and earth and water and air, his Idea also will be a number of certain other underlying things; and the Idea of man, whether it is a number in a sense or not, will still be a numerical ratio of certain things and not a number proper, nor will it be a number merely because it is a numerical ratio.[2]

Again, from many numbers one number is produced, but how can one Form come from many Forms? And if the number comes not from the many numbers themselves but from the units in them,[3] e.g. in 10,000, how is it with the units? If they are specifically alike, numerous absurdities will follow, and also if they are not alike (neither the units in the same number being like one another nor those in different numbers being all like to all); for in what will they differ, as they are without quality? This is not a plausible view, nor can it be consistently thought out. Further, the Platonists must set up a second kind of number (with which arithmetic deals), and all the objects which are called 'intermediate' by some thinkers; and how do these exist or from what principles do they proceed? Or why must they be intermediate between the things in this sensible world and the things-in-themselves?
992^{a} Further, the units in 2 must each come from a prior 2; but

[1] With 991^{a} 8–^{b} 9 cf. M. 1079^{b} 12–1080^{a} 8.

[2] i. e. the Idea is a numerical ratio in some underlying material. It may perhaps be called a sort of (τις) number, but strictly it is a numerical ratio.—The passage, however, is very difficult, and the contradiction in ll. 19, 20 almost intolerable.

[3] 991^{b} 22 read τῶν ἐν τῷ ἀριθμῷ.

this is impossible. Further, why is a number, when taken all together, one? Again, besides what has been said, if the units are *diverse* the Platonists should have spoken like those who say there are four, or two, elements; for each of these thinkers gives the name of element not to that which is common, e. g. to body, but to fire and earth, whether there is something common to them, viz. body, or not. But in fact the Platonists speak as if the One were *homogeneous* like fire or water; and if this is so, the numbers will not be substances.[1] Evidently, if there is a One-in-itself and this is a first principle, 'one' is being used in more than one sense; for otherwise the theory is impossible.

When we Platonists wish to reduce substances to their principles, we state that lines come from the short and long (i. e. from a kind of small and great), and the plane from the broad and narrow, and the solid from the deep and shallow. Yet how then can the plane contain a line, or the solid a line or a plane? For the broad and narrow is a different class of things from the deep and shallow. Therefore, just as number is not present in these, because the many and few are different from these, evidently no other of the higher ⟨more abstract⟩ classes will be present in the lower ⟨more concrete⟩. But again the broad is not a genus which includes the deep, for then the solid would have been a species of plane.[2] Further, from what principle will the presence of the points in the line be derived? Plato even used to object to this class of things ⟨sc. points⟩ as being a geometrical fiction. What we call the point he called the principle of the line, and this is what he meant by the indivisible lines which he often posited. Yet these must have a limit; therefore the argument from which the existence of the line follows proves also the existence of the point.

In general, though philosophy seeks the cause of perceptible things, we Platonists have given this up (for we say nothing of the cause from which change takes its start), but while we fancy we are stating the substance of perceptible things, we assert the existence of a second class of substances, while

[1] Sc. but ordinary mathematical numbers. Cf. M. 1081a 5.
[2] With 992a 10–19 cf. M. 1085a 9–19.

our account of the way in which they are the substances of perceptible things is empty talk; for 'sharing', as we said before,[1] means nothing. Nor have the Forms any connexion with that which we see to be the cause in the case of the arts, and for whose sake mind and nature produce all that they *do* produce,[2]—with this cause which we assert to be one of the first principles; but mathematics has come to be the whole of philosophy for modern thinkers,[3] though they say that it
992^{b} should be studied for the sake of other things.[4] Further, one might suppose that the substance which according to them underlies as matter is too mathematical, and is a predicate and differentia of the substance, i.e. of the matter, rather than the matter itself; i.e. the great and the small are like the rare and the dense which the physical philosophers speak of, calling these the primary differentiae of the substratum; for these are a kind of excess and defect. And regarding movement, if the great and the small are to *be* movement, evidently the Forms will be moved; but if they are not, whence did movement come? If we cannot answer this the whole study of nature has been annihilated.

And what is thought to be easy—to show that all things are one—is not done; for by the separating of the universal from particulars[5] all things do not come to be one but there comes to be a One-in-itself, if we grant all the assumptions. And not even this follows, if we do not grant that the universal is a class; and this in some cases it cannot be.

Nor can it be explained either how the lines and planes and solids that come after the numbers exist or can exist, or what meaning they have; for these can neither be Forms (for they are not numbers), nor the intermediates (for those are the objects of mathematics), nor the perishable things. This is evidently a distinct fourth class.[6]

In general, if we search for the elements of existing things without distinguishing the many senses in which things are said to exist, we cannot succeed, especially if the search for

[1] 991^{a} 8–^{b} 9. [2] Sc. the final cause. [3] Cf. B. 996^{a} 29–^{b} 1.
[4] Cf. Plato, *Rep.* vii. 531 D, 533 B–D. 992^{a} 33 read φασκόντων ἄλλων.
[5] For this Platonic method cf. B. 1003^{a} 10, Z. 1031^{b} 21, M. 1086^{b} 10.
[6] Cf. Z. 1028^{b} 24, M. 1080^{b} 23.

the elements of which things are made is conducted in the Platonic manner. For it is surely impossible to discover what 'acting' or 'being acted on', or 'the straight', is made of, but if elements can be discovered at all, it is only the elements of substances; therefore to seek the elements of all existing things or to think one has them is incorrect. And how could we *learn* the elements of all things? Evidently we cannot start by knowing something before. For as he who is learning geometry, though he may know other things before, knows none of the things with which the science deals and about which he is to learn, so is it in all other cases. Therefore if there is a science of all things, as some maintain, he who is learning this will know nothing before. Yet all learning is by means of premises which are (either all or some of them) known before,—whether the learning be by demonstration or by definitions; for the elements of the definition must be known before and be familiar; and learning by induction proceeds similarly. But again, if the science is innate, it 993a
is wonderful that we are unaware of our possession of the greatest of sciences. Again, how is one to *know* what all things are made of, and how is this to be made *evident*? This also affords a difficulty; for there might be a conflict of opinion, as there is about certain syllables; some say *za* is made out of *s* and *d* and *a*, while others say it is a distinct sound and none of those that are familiar. Further, how could we know the objects of sense without having the sense in question? Yet we should, if the elements of which all things consist, as complex sounds consist of their proper elements, are the same.

CHAPTER X

It is evident, then, even from what we have said before, that all men seem to seek the causes named in the *Physics*[1], and that we cannot name any beyond these; but they seek these vaguely; and though in a sense they have all been described before, in a sense they have not been described at

[1] ii. 3, 7.

all. For the earliest philosophy is, on all subjects, like one who lisps, since in its beginnings it is but a child.[1] For even Empedocles says[2] bone exists by virtue of the ratio in it. Now this is the essence and the substance of the thing. But it is similarly necessary that the ratio should be the substance of flesh and of everything else, or of none; therefore it is on account of this that flesh and bone and everything else will exist, and not on account of the matter, which *he* names,—fire and earth and water and air. But while he would necessarily have agreed if another had said this, he has not said it clearly.

On such questions our views have been expressed before; but let us return to enumerate the difficulties that might be raised on these same points; for perhaps we may get some help towards our later difficulties.

[1] 993a 16 read *νέα κατ' ἀρχὰς οὖσα, ἐπεί.*
[2] Diels, *Vorsokratiker*, ed. 2, fr. 96 and p. 166. 4.

BOOK II (α)

CHAPTER I

THE investigation of the truth is in one way hard, in another easy. An indication of this is found in the fact that no one is able to attain the truth adequately, while, on the other hand, 993b no one fails entirely, but every one says something true about the nature of things, and while individually they contribute little or nothing to the truth, by the union of all a considerable amount is amassed. Therefore, since the truth seems to be like the proverbial door, which no one can fail to hit, in this way it is easy, but the fact that we can have a whole truth and not the particular part we aim at shows the difficulty of it.

Perhaps, as difficulties are of two kinds, the cause of the present difficulty is not in the facts but in us. For as the eyes of bats are to the blaze of day, so is the reason in our soul to the things which are by nature most evident of all.

It is just that we should be grateful, not only to those whose opinions we may share, but also to those who have expressed more superficial views; for these also contributed something, by developing before us the powers of thought. It is true that if there had been no Timotheus we should have been without much of our lyric poetry; but if there had been no Phrynis there would have been no Timotheus. The same holds good of those who have expressed views about the truth[1]; for from the better thinkers we have inherited certain opinions, while the others have been responsible for the appearance of the better thinkers.

It is right also that philosophy should be called knowledge of the truth. For the end of theoretical knowledge is truth, while that of practical knowledge is action (for even if they consider how things are, practical men do not study the cause in itself, but[2] in some relation and at some time). Now we do not

[1] 993b 17 read περὶ τῶν περὶ τῆς. [2] 993b 22 read οὐ τὸ αἴτιον καθ' αὑτὸ ἀλλά.

know a truth without its cause; and a thing has a quality in a higher degree than other things if in virtue of it the similar quality belongs to the other things (e.g. fire is the hottest of things; for it is the cause of the heat of all other things); so that that which causes derivative truths to be true is most true. Therefore the principles of eternal things must be always most true; for they are not merely sometimes true, nor is there any cause of their being, but they themselves are the cause of the being of other things, so that as each thing is in respect of being, so is it in respect of truth.

CHAPTER II

994a Evidently there is a first principle, and the causes of things are neither an infinite series nor infinitely various in kind. For (1), on the one hand, one thing cannot proceed from another, as from matter, *ad infinitum*, e.g. flesh from earth, earth from air, air from fire, and so on without stopping; nor on the other hand can the efficient causes form an endless series, man for instance being acted on by air, air by the sun, the sun by Strife, and so on without limit. Similarly the final causes cannot go on *ad infinitum*,—walking for the sake of health, this for the sake of happiness, happiness for the sake of something else, and so one thing always for the sake of another. And the case of the formal cause is similar. For in the case of an intermediate, which has a last term and a prior term outside it, the prior must be the cause of the later terms. For if we had to say which of the three is the cause, we should say the first; surely not the last, for the final term is the cause of none; nor even the intermediate, for it is the cause only of one. It makes no difference whether there is one intermediate or more, nor whether they are infinite or finite in number. But of series which are infinite in this way, and of the infinite in general, all the parts down to that now present are alike intermediates; so that if there is no first there is no cause at all.

Nor can there be an infinite process downwards, with a beginning in the upper direction, so that water should proceed from fire, earth from water, and so always some other kind should be produced. For one thing comes *from* another in

two ways (if we exclude the sense in which 'from' means 'after,' as we say 'from the Isthmian games come the Olympian'), (*a*) as the man comes from the boy, by the boy's changing, or (*b*) as air comes from water. By 'as the man comes from the boy' we mean 'as that which has come to be from that which is coming to be, or as that which is finished from that which is being achieved' (for as becoming is between being and not being, so that which is becoming is always between[1] that which is and that which is not; and the learner is a man of science in the making, and this is what is meant when we say that *from* a learner a man of science is being made); on the other hand, coming from another thing as water comes from air implies the destruction of the other thing. This is why changes of the former kind are not reversible,—the boy does not come from the man (for that which comes to be does not come to be *from* the process of coming to be, but exists *after*[2] the process of coming to be; for it is thus that the day comes 994^{b}
from the morning—in the sense that it comes after the morning; and therefore the morning cannot come from the day); but changes of the other kind are reversible. But in both cases it is impossible that the number of terms should be infinite. For terms of the former kind being intermediates[3] must have an end, and terms of the latter kind change into *one another*; for the destruction of either is the generation of the other.

At the same time it is impossible that the first cause, being eternal, should be destroyed; for while the process of becoming is not infinite in the upward direction, a first cause by whose destruction something came to be could not be eternal.[4]

[1] 994^{a} 27 read ἐστι μεταξύ.

[2] 994^{b} 1 read ἀλλ' ἔστι. The meaning seems to be, that in this kind of change the y that comes from x is not simply x rearranged, but x affected by a lapse of time. ∴ x cannot be got from y.

[3] Cf. ^{a}27–29.

[4] This paragraph is very obscure. Aristotle has in ^{a}11–19 given a general argument which applies to all the four causes, to show that there must always be a first cause. This, he assumes, must be eternal. He now applies this argument to the prime material cause, and shows that it must be indestructible. There are two difficulties in the paragraph:—

(1) It seems pointless to say that the first cause must be indestructible *because* it is eternal. Ground and consequent appear to be identical. But probably the object is to show that the first cause must be to its

Further, the *final cause* is an end, and that sort of end which is not for the sake of something else, but for whose sake everything else is; so that if there is to be a last term of this sort, the process will not be infinite; but if there is no such term there will be no final cause. But those who maintain the infinite series destroy the Good without knowing it. Yet no one would try to do anything if he were not going to come to a limit. Nor would there be reason in the world;[1] the reasonable man, at least, always acts for a purpose; and this is a limit, for the end is a limit.

But the *formal cause*, also, cannot be reduced always to another definition which is fuller in expression.[2] For the original definition is always more of a definition, and not the later one; and in a series in which the first term is not correct, the next is not so either.—Further, those who speak thus destroy science; for it is not possible to have this till one comes to the indivisible concepts. And knowledge becomes impossible; for how can one think things that are infinite in this way[3]? For this is not like the case of the line, to whose divisibility there is no stop, but which we cannot think if we do not make a stop; so that one who is tracing the infinitely divisible line cannot be counting the possibilities of section.

But further, the *matter* in a changeable thing must be cognized[4].

Again, nothing infinite can exist; and if it could, at least being infinite is not infinite.[5]

But (2) if the *kinds* of causes had been infinite in number, then also knowledge would have been impossible; for we think

effects not as water to air but as boy to man. It develops into them, and is not destroyed when they come into being.

(2) The clause beginning with ἐπεί seems, as is often the case, to be elliptical. The meaning probably is:—'Since the process of becoming is not infinite in the upward direction, ⟨there must be an eternal first cause, but⟩ a first cause by whose destruction something came to be could not be eternal.'

[1] 994b 15 read ἐν τοῖς οὖσιν.

[2] i.e. one can reduce the definition of man as 'mortal rational animal' to 'mortal rational sensitive living substance', but one cannot carry on process *ad infinitum*.

[3] i.e. *actually* infinite.

[4] Sc. and therefore cannot form an infinite series.

[5] i.e. the notion of infinity does not contain an infinite number of marks.

we know, only when we have ascertained all the causes, but that which is infinite by addition cannot be gone through in a finite time.

CHAPTER III

The effect which lectures produce on a hearer depends on his habits; for we demand the language we are accus- 995a
tomed to, and that which is different from this seems not in keeping but somewhat unintelligible and foreign because of its unwontedness. For the customary is more intelligible. The force of habit is shown by the laws, in whose case, with regard to the legendary and childish elements in them, habit has more influence than our knowledge about them [1]. Some people do not listen to a speaker unless he speaks mathematically, others unless he gives instances, while others expect him to cite a poet as witness. And some want to have everything done accurately, while others are annoyed by accuracy, either because they cannot follow the connexion of thought or because they regard it as pettifoggery. For accuracy has something of this character, so that as in trade so in argument some people think it mean. Therefore one must be already trained to know how to take each sort of argument, since it is absurd to seek at the same time knowledge and the way of attaining knowledge; and neither is easy to get.

The minute accuracy of mathematics is not to be demanded in all cases, but only in the case of things which have no matter. Therefore its method is not that of natural science; for presumably all nature has matter. Hence we must inquire first what nature is: for thus we shall also see what natural science treats of [and whether it belongs to one science or to more to investigate the causes and the principles of things].[2]

[1] 995a 4 read ἐν οἷς περὶ τὰ . . . αὐτῶν τὸ ἔθος.
[2] This clause has probably been wrongly inserted from 995b 6.

BOOK III (B)

CHAPTER I

We must, with a view to the science which we are seeking, first recount the subjects that should be first discussed. These include both the other opinions that some have held on certain points, and any points besides these that happen[1] to have been overlooked. For those who wish to get clear of difficulties it is advantageous to state the difficulties well; for the subsequent free play of thought implies the solution of the previous difficulties, and it is not possible to untie a knot which one does not know. But the difficulty of our thinking points to a 'knot' in the object; for in so far as our thought is in difficulties, it is in like case with those who are bound; for in either case it is impossible to go forward. Therefore one should have surveyed all the difficulties beforehand, both for the reasons we have stated and because people who inquire without first stating the difficulties are like those who do not know where they have to go; besides, a man does not otherwise know even whether he has found what he is looking for or not;
995b for the end is not clear to such a man, while to him who has first discussed the difficulties it is clear. Further, he who has heard all the contending arguments, as if they were the parties to a case, must be in a better position for judging.

The first problem concerns the subject[2] which we discussed in our prefatory remarks. It is this—whether the investigation of the causes belongs to one or to more sciences,[3] and, if to one, whether this should survey only the first principles of substance, or also the principles on which all men base their proofs, e.g. whether it is possible at the same time to assert and deny one and the same thing or not, and all other such questions.[4] And if the science in question deals with sub-

[1] 995a 27 read τυγχάνει.
[2] Sc. the four causes.
[3] Cf. 996a 18–b 26.
[4] Cf. 996b 26–997a 15.

stance, whether does *one* science deal with all substances, or more than one, and if more, whether are all akin, or must some of them be called forms of Wisdom and the others something else?[1] And this itself is also one of the things that must be discussed—whether sensible substances alone should be said to exist or others also besides them, and whether these others are of one kind or there are several classes of substances, as is supposed by those who believe both in Forms and in mathematical objects intermediate between these and sensible things.[2] We must inquire, then, as we say, into these questions, and also whether our investigation is concerned only with substances or also with the essential attributes of substances.[3] Further, with regard to the same and other and like and unlike and contrariety, and with regard to prior and posterior and all other such terms, about which the dialecticians try to inquire, starting their investigation from probable premises only,—whose business is it to inquire into all these? Further, we must discuss the essential attributes of these themselves; and we must ask not only what each of these is, but also whether one thing always has one contrary.[4] Again, whether are the principles and elements of things the *classes*, or the *parts* present in each thing, into which it is divided;[5] and if they are the classes, whether are they the classes that are predicated proximately of the individuals, or the highest classes, e.g. whether is animal or man the first principle and the more independent of the individual instance?[6] And we must inquire and discuss especially whether there is, besides the matter, any thing that is a cause in itself or not, and whether this can exist apart or not, and whether it is one or more in number. Once more, is there something apart from the concrete thing (by the concrete thing I mean the matter with something predicated of it), or is there nothing apart, or is there something in some cases though not in others, and what sort of cases are these[7]? Again we ask whether 996a
the principles are limited in number or in kind, both those in

[1] Cf. 997a 15–25.
[2] Cf. 997a 34–998a 19.
[3] Cf. 997a 25–34.
[4] Cf. Γ. 1003b 32–1005a 18, Z. 10, and (I).
[5] Cf. 998a 20–b 14.
[6] Cf. 998b 14–999a 23.
[7] Cf. 999a 24–b 24.

the formulae and those in the substratum;[1] and whether the principles of perishable and of imperishable things are the same or different; and whether they are all imperishable or those of perishable things are perishable.[2] Further there is the question which is hardest of all and most perplexing, whether unity and being, as the Pythagoreans and Plato said, are not attributes of something else but are the substance of existing things, or this is not the case, but the substratum is something else,—as Empedocles says, love; as someone else says, fire; while one says water and one, air.[3] Again we ask whether the principles are universal or like individual things,[4] and whether they exist potentially or actually; further, whether they are potential or actual in any other sense than in reference to movement;[5] for these questions also would present much difficulty. Further, whether are numbers and lines and figures and points a kind of substance or not, and if they are substances whether are they separate from sensible things or present in them?[6] With regard to all these matters not only is it hard to get possession of the truth, but it is not easy even to think out the difficulties well.

CHAPTER II

First then with regard to what we mentioned first, whether does it belong to one or to more sciences to investigate all the kinds of causes? How could it belong to one science to know the principles if these are not contrary?

Further, there are many things to which not all the principles pertain. For how can a principle of change or the nature of the good be present in unchangeable things, since everything that in itself and by its own nature is good is an end, and a cause in the sense that for its sake the other things both come to be and are, and since an end or purpose is the end of some action, and all actions imply change; so that in unchangeable things this principle could not exist nor could there be a good-in-itself. This is why in mathematics nothing

[1] Cf. 999b 24–1000a 4.
[2] Cf. 1000a 5–1001a 3.
[3] Cf. 1001a 4–b 25.
[4] Cf. 1003a 5–17.
[5] Cf. 1002b 32–1003a 5.
[6] Cf. 1001b 26–1002b 11.

is proved by means of this kind of cause, nor is there any demonstration of this kind—'because it is better, or worse'; indeed no one even mentions anything of the kind. And so for this reason some of the Sophists, e.g. Aristippus, ridiculed mathematics; for in the arts, even in the industrial arts, e.g. in carpentry and cobbling, the reason always given is 'because it is better, or worse', but the mathematical sciences take no account of goods and evils.

But if there are several sciences of the causes, and a different science for each different principle, which of these 996b
sciences should be said to be that which we seek, or which of the people who possess them has the most scientific knowledge of the object in question? The same thing may have all the kinds of causes, e.g. the moving cause of a house is the art or the builder, the final cause is the function it fulfils, the matter is earth and stones, and the form is the definitory formula. To judge from our previous discussion[1] of the question which of the sciences should be called Wisdom, there is reason for applying the name to each of them. For inasmuch as it is most architectonic and authoritative and the other sciences, like slave-women, may not even contradict it, the science of the *end* and of the *good* is of the nature of Wisdom (for the other things are for the sake of the end). But inasmuch as it was described as dealing with the first causes and that which is in the highest sense object of knowledge, the science of *substance*[2] must be of the nature of Wisdom. For as men may know the same thing in many ways, we say that he who knows what a thing is by the characteristics it has knows more fully than he who knows it by the characteristics it has not, and in the former class itself one knows more fully than another, and he knows most fully who knows what a thing is, not he who knows its quantity or quality or what it can by nature do or have done to it; and further in all other cases also (i.e. where demonstration is possible)[3] we think that the knowledge

[1] Cf. A. 2.

[2] i.e. essence.

[3] 996b 19 καὶ ὧν ἀποδείξεις εἰσί appears to be explanatory of ἐν τοῖς ἄλλοις. The meaning is that whether the essence is known directly (as in the case of substances) or by means of demonstration (as in the case of attributes or of events like thunder or eclipse), knowledge of the essence is the primary knowledge.

of each thing is present when we know what it is, e.g. what squaring a rectangle is, viz. that it is the finding of a mean; and similarly in all other cases. And we know about becomings and actions and about every change when we know the *source of the movement*; and this is other than and opposed to the end. Therefore it would seem to belong to different sciences to investigate these causes severally.[1]

But, regarding the starting-points of demonstration also, it is a disputable question whether they are the object of one science or of more. By the starting-points of demonstration I mean the common beliefs, on which all men base their proofs, e.g. that everything must be either affirmed or denied, and that a thing cannot at the same time be and not be, and all other such premises; the question is whether the same science deals with them as with substance, or a different science, and if it is not one science, which of the two must be identified with that which we now seek.—It is not reasonable that these topics should be the object of one science; for why should it be peculiarly appropriate to geometry or to any other science to understand these matters? If then it belongs to every
997a science alike, and cannot belong to all, it is not peculiar to the science which investigates substances, any more than to any other science, to know about these topics.—And, at the same time, in what way can there be a *science* of the first principles? For we are aware even now what each of them is; at least even other sciences use them as familiar. And if there is a demonstrative science which deals with them, there will have to be an underlying kind, and some of them must be demonstrable attributes and others must be axioms (for it is impossible that there should be demonstration about all things); for the demonstration must start from certain premises and be about a certain subject and prove certain attributes. Therefore it follows that all attributes that are proved must belong to one class; for all demonstrative sciences use the axioms.—But if the science of substance and the science which deals with the axioms are different, which of them is more authoritative and prior? The *axioms* are most universal and are principles of

[1] With 996a 18–b 26 cf. 995b 5–7. For the answer to this problem cf. Γ. 2.

all things. And if it is not the business of the philosopher, to whom else will it belong to inquire what is true and what is untrue about them?[1]

In general, do all substances fall under one science or under more than one? If the latter, to what sort of substance is the present science to be assigned? On the other hand, it is not reasonable that one science should deal with all. For then there would be one demonstrative science dealing with all attributes. For every demonstrative science investigates with regard to some subject its essential attributes, starting from the common beliefs.[2] Therefore to investigate the essential attributes of one subject, starting from one set of beliefs, is the business of one science. For the subject belongs to one science, and the premises belong to one, whether to the same or to another; so that the attributes also are investigated either by these sciences or by one derived from them.[3]

Further, does our investigation deal with substances alone or also with their attributes? I mean for instance, if the solid is a substance and so are lines and planes, is it the business of the same science to know these and to know the attributes of each of these classes (the attributes which the mathematical sciences prove), or of a different science? If of the *same*, the science of substance also must be a demonstrative science; but it is thought that there is *no* demonstration of the essence of things. And if of *another*, what will be the science that investigates the attributes of substance? This is a very difficult question.[4]

Further, must we say that sensible substances alone exist, or that there are others besides these? And are substances of one kind or are there several kinds of substances, as those say who assert the existence both of the Forms and of the 997^{b}
intermediates with which they say the mathematical sciences deal?—In what sense we[5] say the Forms are causes and substances in themselves has been explained in our first remarks

[1] With 996^{b} 26–997^{a} 15 cf. 995^{b} 7–10. For the answer cf. Γ. 3.
[2] Cf. 996^{b} 28.
[3] 997^{a} 24 read εἴθ' αὗται. But no really good sense can be made of the passage. With 997^{a} 15–25 cf. 995^{b} 10–13. For the answer cf. Γ. 1004^{a} 2–9, E. 1.
[4] With 997^{a} 25–34 cf. 995^{b} 18–20. For the answer cf. Γ. 1004^{b} 5–26.
[5] Cf. note on A. 990^{b} 9.

about them;[1] while the ideal theory presents difficulties in many ways, the most paradoxical thing of all is the statement that there are certain things besides those in the material universe, and that these are the same as sensible things except that they are eternal while the latter are perishable. For they say there is a man-in-himself and a horse-in-itself and health-in-itself, with no further qualification,—a procedure like that of the people who said there are gods, but in human form. For they were positing nothing but eternal men, nor are the Platonists making the Forms anything other than eternal sensible things.—Further, if we are to posit besides the Forms and the sensibles the intermediates between them, we shall have many difficulties. For clearly on the same principle there will be lines besides the lines-in-themselves and the sensible lines, and so with each of the other classes of things; so that since astronomy is one of these mathematical sciences there will also be a heaven besides the sensible heaven, and a sun and a moon (and so with the other heavenly bodies) besides the sensible. Yet how are we to believe these things? It is not reasonable even to suppose these bodies immovable, but to suppose their *moving* is quite impossible. And similarly with the things of which optics and mathematical harmonics treat. For these also cannot exist apart from the sensible things, for the same reasons. For if there are sensible things and sensations intermediate between Form and individual, evidently there will also be animals intermediate between animals-in-themselves and the perishable animals.—We might also raise the question, with reference to *which kind* of existing things we must look for these additional sciences. If geometry is to differ from mensuration only in this, that the latter of these deals with things that we perceive, and the former with things that are not perceptible, evidently there will be a science other than medicine, intermediate between medical-science-in-itself and this individual medical science, and so with each of the other sciences. Yet how is this possible? There would have to be also healthy things besides the perceptible healthy things and the healthy-in-itself. And at the same

[1] Cf. A. 6 and 9.

time not even this is true, that mensuration deals with perceptible and perishable magnitudes; for then it would have perished, when they perished. And astronomy also cannot be dealing with perceptible magnitudes nor with this heaven above us. For neither are perceptible lines such lines as the geometer speaks of (for no perceptible thing is straight or curved in the 998^a
way in which he defines 'straight' and 'curved'; for a hoop touches a straight edge not at a point, but as Protagoras said it did, in his refutation of the geometers), nor are the movements and complex orbits in the heavens like those of which astronomy treats, nor have geometrical points the same nature as the actual stars.—Now there are some who say that these so-called intermediates between the Forms and the perceptible things exist, not apart from the perceptible things, however, but in these; the impossible results of this view would take too long to enumerate, but it is enough to consider such points as the following:—It is not reasonable that this should be so only in the case of these *intermediates*, but clearly the *Forms* also might be in the perceptible things; for the same account applies to both. Further, it follows from this theory that there are two solids in the same place, and that the intermediates are not immovable, since they are in the moving perceptible things. And in general to what purpose would one suppose them to *exist* indeed, but to exist *in* perceptible things? For the same paradoxical results will follow which we have already mentioned; there will be a heaven besides *the* heaven, only it will be not apart but in the same place; which is still more impossible.[1]

CHAPTER III

Apart from the difficulty of stating the case truly with regard to these matters, it is hard to say, with regard to the first principles, whether it is the genera that should be taken as elements and principles, or rather the primary constituents of a thing; e.g. it is the primary parts of which all articulate sounds consist that are thought to be elements and principles

[1] With 997^a 34–998^a 19 cf. 995^b 13–18. For the answer cf. Λ. 6–10, M. 2, 3.

of articulate sound, not the common genus—articulate sound; and we give the name of 'elements' to those geometrical propositions, the proofs of which are implied in the proofs of the others, either of all or of most. Further, both those who say there are several elements of corporeal things and those who say there is one, say the parts of which bodies consist and are compounded are principles, e.g. Empedocles says fire and water and the intermediates between these are the constituent elements of things, but does not describe these as genera of existing things. Besides this, if we want to examine the 998b nature of anything else, we examine the parts of which, e.g., a bed consists and how they are put together, and then[1] we know its nature. To judge from these arguments, then, the principles of things would not be the genera; but in so far as we know each thing by its definition, and the genera are the principles or starting-points of definitions, the genera must also be the principles of definable things. And if to get the knowledge of things is to get the knowledge of the species according to which they are named, the genera are at least starting-points of the *species*. And some also of those who say unity and being, or the great and the small, are elements of things, seem to treat them as genera.—But, again, it is not possible to describe the principles in *both* ways. For the formula of the essence is one; but definition by genera will be different from that which states the constituent parts of a thing.[2]

Besides this, even if the genera are in the highest degree principles, whether should one regard the first of the genera as principles, or those which are predicated directly of the individuals? This also admits of dispute. For if the universal is always more of a principle, evidently the uppermost of the genera are the principles; for these are predicated of all things. There will, then, be as many principles of things as there are primary genera, so that both being and unity will be principles and substances; for these are most of all predicated of all things. But it is not possible that either unity or being

[1] 998b 1 read ἀθρεῖν, ἀθρεῖ οἷον . . . συγκειμένων, καὶ τότε.
[2] With 998a 20–b 14 cf. 995b 27–9. For the answer cf. Z. 10, 13.

should be a genus of things; for the differentiae of any genus must each of them both have being and be one, but it is not possible for the genus to be predicated of the differentiae taken apart from the species (any more than for the species of the genus to be predicated of the proper differentiae of the genus); so that if unity or being is a genus, no differentia will either be one or have being. But if unity and being are not genera, neither will they be principles, if the genera are the principles.—Again, the intermediate classes, whose concepts include the differentiae, will on this theory be genera, down to the individuals; but as it is, some are thought to be genera and others are not thought to be so. Besides this, the differentiae are principles even more than the genera; and if these also are principles, there comes to be practically an infinite number of principles, especially if we suppose the highest genus to be a principle.—But again, if unity *is* more of the nature of a 999a
principle, and the indivisible is one, and everything indivisible is so either in quantity or in species, and that which is so in species is prior to the divisible, and genera are divisible into species (for man is not the *genus* of individual men), that which is predicated directly of the individuals will have more unity.—Further, in the case of things in which the distinction of prior and posterior is present, that which is predicable of these things cannot be something apart from them; e.g. if two is the first of numbers, there will not be a Number apart from the kinds of numbers; and similarly there will not be a Figure apart from the kinds of figures; and if the genera of these things do not exist apart from the species, the genera of other things will scarcely do so; for genera of these things are thought to exist if any do. But in the indivisible species one member is not prior and another posterior. Further, where one is better and another worse, the better is always prior; so that of these also no genus can exist. From these considerations, then, the species predicated of individuals seem to be principles rather than the genera.—But again, it is not easy to say in what sense these are to be taken as principles. For the principle or cause must exist alongside of the things of which it is the principle, and must be capable of existing in separation from them; and for what reason should we suppose

any such thing to exist alongside of the individual, except that it is predicated universally and of all? But if this is the reason, the more universal must be supposed to be more of a principle; so that the highest genera would be the principles.[1]

CHAPTER IV

There is a difficulty connected with these, the hardest of all and the most necessary to examine, and to this our argument has now brought us. If, on the one hand, there is nothing apart from individual things, and the individuals are infinite in number, how is it possible to get knowledge of the *infinite*[2] individuals? For all things that we know, we know in so far as they have some unity and identity, and in so far as some attribute belongs to them universally.—But if this is necessary, and there must be something apart from the individuals, it will be necessary that the classes exist apart from the individuals,—either the lowest or the highest classes; but we found by discussion just now that this is impossible.—Further, if we admit in the fullest sense that something exists apart from the concrete thing, whenever something is predicated of the matter, must there, if there is something apart, be something corresponding to each set of individuals, or to some and not to
999b others, or to none?[3] (1) If there is nothing apart from individuals, there will be no object of thought, but all things will be objects of sense, and there will not be knowledge of anything, unless we say that sensation is knowledge. Further, nothing will be eternal or unmovable; for all perceptible things perish and are in movement. But if there is nothing eternal, neither can there be a process of coming to be; for that which comes to be, and that from which it comes to be, must be something, and the ultimate term in this series cannot have come to be, since the series has a limit and nothing can come to be out of that which is not.—Further, if generation and movement exist there

[1] With 998^b 14–999^a 23 cf. 995^b 29–31. For the answer cf. Z. 12. 1038^a 19, and 13.

[2] 999^a 27 read τῶν γ' ἀπείρων.

[3] The question which individuals have something apart corresponding to them suggests to Aristotle the further question whether any have. Thus the end of the sentence takes a form inconsistent with the beginning.

must also be a limit; for no movement is infinite, but every movement has an end, and that which is incapable of completing its coming to be cannot be in process of coming to be; and that which has completed its coming to be must *be* as soon as it has come to be.[1]—Further, since the matter exists,[2] because it is ungenerated, it is *a fortiori* reasonable that the substance or essence, that which the matter is at any time coming to be, should exist; for if neither essence nor matter is, nothing will be at all. And since this is impossible there must be something besides the concrete thing, viz. the shape or form.—But again (2) if we are to suppose this, it is hard to say in which cases we are to suppose it and in which not. For evidently it is not possible to suppose it in all cases; we could not suppose that there is a house besides the particular houses.—Besides this, will the substance of all the individuals, e.g. of all men, be one? This is paradoxical, for all the things whose substance is on this view one are not one.[3] But are they many and different? This also is unreasonable.—At the same time, how does the matter become each of the individuals, and how *is* the concrete thing these two elements?[4]

Again, one might ask the following question also about the first principles. If they are one *in kind* only, nothing will be numerically one, not even unity-itself and being-itself. And how will it be possible to know, if there is not to be something common to a whole set of individuals? But if there is a common element which is *numerically* one, and each of the principles is one, and the principles are not as in the case of perceptible things different for different things (e.g. since this particular syllable is the same in kind whenever it occurs, the elements of it are also the same in kind; only in kind, for these also, like the syllable, are numerically different in different contexts),—if the principles of things are not one in this sense, but are numerically one, there will be nothing else besides the elements; for there is no difference of meaning between

[1] Sc. and thus there is a limit to its coming to be.

[2] Sc. before the concrete thing.

[3] 999^b 21 read *οὐ γὰρ ἓν ἅπαντα*.

[4] With 999^a 24–^{b} 24 cf. 995^b 31–36. For the answer cf. Z. 6, Λ. 6–10, M. 10.

'numerically one' and 'individual'. For this is just what we mean by the indivídual—the numerically one, and by the universal we mean that which is predicable of the individuals.
1000a Therefore just as, if the elements of articulate sound were limited in number, all the literature in the world would be confined to the ABC, since there could not be two or more letters of the same kind, so is it with all existing things and their first principles.[1]

One difficulty which is as great as any has been omitted both by modern philosophers and by their predecessors—whether the principles of perishable and those of imperishable things are the same or different. If they are the same, how are some things imperishable and others perishable, and for what reason? The school of Hesiod and all the mythologists thought only of what was plausible to themselves, and had no regard to us. For asserting the first principles to be gods and born of gods, they say that the beings which did not taste of nectar and ambrosia became mortal; and clearly they are using words which are familiar to themselves, yet what they have said even about the very application of these causes is above our comprehension. For if the gods taste nectar and ambrosia for their pleasure, these are in no wise the causes of their existence; and if they taste them to maintain their existence, how can gods who need food be eternal?—But into the subtleties of the mythologists it is not worth our while to inquire seriously; those, however, who use the language of proof we must cross-examine and ask why, after all, things which consist of the same elements are, some of them, eternal in nature, while others perish. Since these philosophers mention no cause, and it is unreasonable that things should be as they say, evidently the principles or causes of things cannot be the same. Even the man whom one might suppose to speak most consistently—Empedocles,—even he has made the same mistake; for he maintains that strife is a principle that causes *destruction*, but strife would seem none the less to *produce* everything, except the One; for all

[1] With 999b 24–1000a 4 cf. 996a 1–2. For the answer cf. Z. 14, Λ. 4 M. 10.

things excepting God proceed from strife. At least he says:—

From which grew all that was and is and will be hereafter—
Trees, and men and women, and beasts and birds
And water-nourished fish, and long-aged gods.[1]

The implication is evident even apart from these words; for if strife had not been present in things, all things would have been one, as he says—'when they have come together, strife stands outermost.'[2] Hence it also follows on his theory that God most blessed is less wise than all others; for he does not know all the elements; for he has in him no strife, and knowledge is of the like by the like. 'For by earth,' he says,

we see earth, by water water,
By ether godlike ether, by fire wasting fire,
Love by love, and strife by gloomy strife.[3]

But—and this is the point we started from—this at least is evident, that on his theory it follows that strife is as much the cause of existence as of destruction. And similarly friendship is not specially the cause of existence; for in collecting things into the One it destroys all other things.—And at the same time Empedocles mentions no cause of the change itself, except that things are so by nature.

But when strife waxed great in the limbs,
And sprang to honour as the time was fulfilled
Which is fixed for them in turn by a mighty oath.[4]

This implies that change was necessary; but he shows no cause of the necessity. But yet so far at least he alone speaks consistently; for he does not make some things perishable and others imperishable, but makes all perishable except the elements.[5] The difficulty we are speaking of now is, why some things are perishable and others are not, if they consist of the same principles.

Let this suffice as proof of the fact that the principles cannot be the same. But if there are different principles, one difficulty is whether these themselves will be imperishable or perishable. For if they are *perishable*, evidently these also must consist of

[1] Fr. 21 Diels, *Vorsokratiker*. [2] Fr. 36 Diels, *ib.*
[3] Fr. 109 Diels, *ib.*
[4] 1000b 16 read παρ' ἐλήλαται. Fr. 30 Diels, *ib.*
[5] But cf. Diels, *ib.* p. 161, § 52.

certain elements; for all things that perish, perish by being resolved into the elements of which they consist; so that it follows that prior to the principles there are other principles. And this is impossible, whether the process has a limit or proceeds to infinity. Further, how will perishable things exist, if their principles are to be destroyed? But if the principles are *imperishable*, why will things composed of *some* imperishable principles be perishable, while those composed of the others are imperishable? This is not probable, but is either impossible or needs much proof. Further, no one has even tried to maintain different principles; they maintain the
1001a same principles for all things. But they swallow the difficulty we stated first[1] as if they took it to be something trifling.[2]

The hardest inquiry of all, and the one most necessary for knowledge of the truth, is whether being and unity are the substances of things, and whether each of them, without being anything else, is being or unity respectively, *or* we must inquire what being and unity are, with the implication that they have some other underlying nature. For some people think they are of the former, others think they are of the latter character. Plato and the Pythagoreans thought being and unity were nothing else, but this was their nature, their essence being just unity and being. But the natural philosophers take a different line; e.g. Empedocles—as though reducing it to something more intelligible—says what unity is; for he would seem to say it is love: at least, this is for all things the cause of their being one. Others say this unity and being, of which things consist and have been made, is fire, and others say it is air. A similar view is expressed by those who make the elements more than one; for these also must say that being and unity are precisely all the things which they say are principles. (1) If we do not suppose unity and being to be substances, it follows that none of the other universals is a substance; for these are most universal of all. For if[3] there is no unity-itself or being-itself, there will scarcely be in any other case anything apart from what are

[1] 1000a 7.
[2] With 1000a 5–1001a 3 cf. 996a 2–4. For the answer cf. Z. 7–11, Λ.
[3] 1001a 22 read εἰ γάρ.

called the individuals. Further, if unity is not a substance, evidently number also will not exist as an entity separate from the individual things; for number is units, and the unit is something whose essence it is to be one.—But (2) if there is a unity-itself and a being-itself, their substance must be unity and being; for it is not something else that is predicated universally of them, but just unity and being. But if there is to be a being-itself and a unity-itself, there is much difficulty in seeing how there will be anything else besides these,—I mean, how things will be more than one in number. For what is different from being does not exist, so that it necessarily follows, according to the argument of Parmenides, that all things that are are one and this is being.—There are objections to both views. For whether unity is not a substance or there *is* a unity- 1001b
itself, number cannot be a substance. We have already[1] said why this result follows if unity is not a substance: and if it is, the same difficulty arises as arose with regard to being. For whence is there to be another one besides the unity-itself? It must be not-one; but all things are either one or many, and of the many each is one.—Further, if the unity-itself is indivisible, according to Zeno's doctrine[2] it will be nothing. For that which neither when added makes a thing greater nor when subtracted makes it less, he asserts to have no being, evidently assuming that whatever has being is a spatial magnitude. And if it is a magnitude, it is corporeal; for the corporeal has being in every dimension, while the other objects of mathematics, e.g. a plane or a line, added in one way will increase what they are added to, but in another way will not do so,[3] and a point or a unit does so in no way. But if he argues thus,[4] his argument is of a low order; and an indivisible thing *can* exist, so that in this way too the position may be defended even against him; for the indivisible when added will make the number, though not the size, greater. But how can a *magnitude* proceed from one such indivisible or from many? It is like saying that the line is made out

[1] Cf. 1001a 24.
[2] Cf. Diels, *Vorsokratiker*, ed. 2, p. 130, § 21.
[3] e.g. a line added to another at the end makes it longer, but one which lies beside another makes it no broader.
[4] 1001b 13 read εἰ δὴ οὕτως.

of points. But even if one supposes the case to be such that, as some say, number proceeds from the unity-itself and something else which is not one, none the less we must inquire why and how the product will be sometimes a number and sometimes a magnitude, if the not-one was inequality and was the same principle in either case. For it is not evident how magnitudes could proceed either from the one and this principle, or from some number and this principle.[1]

CHAPTER V

A question connected with these is whether numbers and bodies and planes and points are substances or not. If they are not, it baffles us to say what being is and what the substances of things are. For modifications and movements and relations and dispositions and ratios do not seem to indicate the substance of anything; for all are predicated of a subject, and none is a 'this'. And as to the things which might seem most of all to indicate substance, water and 1002a earth and fire and air, of which composite bodies consist, heat and cold and the like are modifications of these, not substances, and the body which is thus modified alone persists as something real and as a substance. But, on the other hand, the body is surely less of a substance than the surface, and the surface less than the line, and the line less than the unit and the point. For the body is bounded by these; and they are thought to be capable of existing without body, but the body cannot exist without these. This is why, while most of the philosophers and the earlier among them thought that substance and being were identical with *corporeal matter*, and that all other things were attributes of this, so that the first principles of bodies were the first principles of being, the more recent and those who were held to be wiser thought *numbers* were the first principles. As we said, then, if these are not substance, there is no substance and no being at all; for surely it is not proper to call the accidents of these

[1] With 1001a 4–b 25 cf. 996a 4–9. For the answer cf. Z. 1040b 16–24, I. 2, M. 1083a 20–5a 2.

beings. But if this is admitted, that lines and points are substance more than bodies, but we do not see to what sort of bodies these could belong (for they cannot be in perceptible bodies), there can be no substance.—Further, these are all evidently divisions of the body,—one a division in breadth, another in depth, another in length.—Besides this, no sort of shape is present in the solid more than any other;[1] so that if the Hermes is not in the stone, neither is the half of the cube in the cube as something determinate; therefore the surface is not in it either; for if any sort of surface were in it, the surface which marks off the half of the cube would be in it too. And the same account applies to the line and to the point and the unit. Therefore, if on the one hand the body is in the highest degree substance, and on the other hand these things are so more than the body, but these are not even instances of substance,[2] it baffles us to say what being is and what the substance of things is.—For besides what has been said, the questions of generation and destruction confront us with further paradoxes. For if substance, not having existed before, now exists, or having existed before, afterwards does not exist, this change is thought to be accompanied by a process of becoming or perishing; but points and lines and surfaces cannot be in process of becoming nor of perishing, though they at one time exist and at another do not. For when bodies come into contact or are separated, their boundaries instantaneously become one at one time—when they touch, and two at another time—when they are separated; so that when they have been put together one boundary does not exist but has perished, and when they have been separated the boundaries exist which before did not exist. For it cannot be said that the point (which is indivisible) was divided into two. And if the boundaries come into being and cease to be, from what do they come into being?[3] A similar account may also be given of the 'now' in time; for this also cannot be in process of coming into being or of ceasing to be, but yet seems to be always

[1] 1002a 21 omit ἢ οὐδέν.
[2] Sc. not to speak of their being the whole of substance.
[3] 1002b 5 read ἐκ τίνος γίγνονται;

different, which shows that it is not a substance. And evidently the same is true of points and lines and planes; for the same argument applies, as they are all alike either limits or divisions.[1]

CHAPTER VI

In general one might raise the question why, besides perceptible things and the intermediates,[2] we have to look for another class of things, such as the Forms which we[3] posit. If it is for this reason, because the objects of mathematics, while they differ from the things in this world in some other respect, differ not at all in that there are many of the same kind, so that their first principles cannot be limited in number (just as the elements of all the language in this sensible world are not limited in number, but in kind, unless one takes the elements of this individual syllable or of this individual articulate sound—whose elements will be limited even in number—, so is it also in the case of the intermediates; for there also the members of the same kind are infinite in number), so that if there are not—besides perceptible and mathematical objects —others such as some maintain the Forms to be, there will be no substance which is one in number as well as in kind, nor will the first principles of things be determinate in number, but only in kind,—if then this must be so, the Forms also must therefore be held to exist. Even if those who support this view do not express it distinctly, still this is what they mean, and they must be maintaining the Forms just because each of the Forms is a substance and none is by accident. But if we are to suppose that the Forms exist and the principles are one in number, not in kind, the impossible results that we have mentioned[4] necessarily follow.

Closely connected with this is the question whether the elements exist potentially or in some other way. If in some other way, there will be something else prior to the first

[1] With 1001^b 26–1002^b 11 cf. 996^a 12–17. For the answer cf. M, N, esp. 1090^b 5–13.

[2] For these cf. A. 6. 987^b 14.

[3] Sc. Platonists.

[4] 999^b 27.

principles; for the potency is prior to the actual cause, and it is not necessary for everything potential to be actual. —But if the elements exist potentially, it is possible that everything that is should not be. For even that which is not yet is capable of being; for that which is not comes to be, but nothing that is incapable of being comes to be.[1]

We must not only raise these questions about the first principles, but also ask whether they are universal or what we call individuals. If they are universal, they will not be substances; for everything that is common indicates not a 'this' but a 'such', but substance is a 'this'.—And if we can actually hypostatize the common predicate as an individual, Socrates will be several animals—himself and 'man' and 'animal,' if each of these indicates a 'this' and a single thing.—If, then, the principles are universals, these results follow; if they are not universals but of the nature of individuals, they will not be knowable; for the knowledge of anything is universal. Therefore if there is to be knowledge of the principles there must be other principles prior to them, which are universally predicated of them.[2]

[1] With 1002^{b} 32–1003^{a} 5 cf. 996^{a} 10–11. For the answer cf. H. 2–Θ. 9, Λ. 6.
[2] With 1003^{a} 5–17 cf. 996^{a} 9–10. For the answer cf. Z. 13, 14, M. 10.

BOOK IV (Γ)

CHAPTER I

THERE is a science which investigates being as being and the attributes which belong to this in virtue of its own nature. Now this is not the same as any of the so-called special sciences; for none of these others deals generally with being as being. They cut off a part of being and investigate the attributes of this part—this is what the mathematical sciences for instance do. Now since we are seeking the first principles and the highest causes, clearly there must be some thing to which these belong in virtue of its own nature. If then our predecessors who sought the elements of existing things were seeking these same principles, it is necessary that the elements must be elements of being not by accident but just because it *is* being. Therefore it is of being as being that we also must grasp the first causes.

CHAPTER II

There are many senses in which a thing may be said to 'be', but they are related to one central point, one definite kind of thing, and have not merely the *epithet* 'being' in common. Everything which is healthy is related to health, one thing in the sense that it preserves health, another in the sense that it produces it, another in the sense that it is a symptom of health, another because it is capable of it.
1003b And that which is medical is relative to the medical art, one thing in the sense that it possesses it, another in the sense that it is naturally adapted to it, another in the sense that it is a function of the medical art. And we shall find other words used similarly to these. So, too, there are many senses in which a thing is said to be, but all refer to one starting-point; some things are said to be because they are

substances, others because they are affections of substance, others because they are a process towards substance, or destructions or privations or qualities of substance, or productive or generative of substance, or of things which are relative to substance, or negations of some of these things or of substance itself. It is for this reason that we say even of non-being that it *is* non-being. As, then, there is one science which deals with all healthy things, the same applies in the other cases also. For not only in the case of things which have one common notion does the investigation belong to one science, but also in the case of things which are related to one common nature; for even these in a sense have one common notion. It is clear then that it is the work of one science also to study all things that are, *qua* being.—But everywhere science deals chiefly with that which is primary, and on which the other things depend, and in virtue of which they get their names. If, then, this is substance, it is of substances that the philosopher must grasp the principles and the causes.

Now for every single class of things, as there is one perception, so there is one science, as for instance grammar, being one science, investigates all articulate sounds. Therefore to investigate all the species of being *qua* being, is the work of a science which is generically one, and to investigate the several species is the work of the specific parts of the science.

If, now, being and unity are the same and are one thing in the sense that they are implied in one another as principle and cause are, not in the sense that they are explained by the same definition (though it makes no difference even if we interpret them similarly—in fact this would strengthen our case); for 'one man' and 'existent man' and 'man' are the same thing, and the doubling of the words in 'the man is *one* and is a *man*'[1] does not give any new meaning (it is clear that his unity is not severed from his humanity either in coming to be or in ceasing to be; and similarly his being is not severed[2]), so that it is obvious that the addition

[1] 1003b 28 read *εἶς ἐστὶν ἄνθρωπος καὶ ἔστιν ἄνθρωπος.*
[2] 1003b 30 read *τοῦ ὄντος.*

in these cases means the same thing, and unity is nothing apart from being[1]; and if, further, the essence of each thing is one in no merely accidental way, and similarly is from its very nature something that *is*:—all this being so, there must be exactly as many species of being as of unity. And to investigate the essence of these is the work of a science which is generically one—I mean, for instance, the discussion of the same and the similar and the other concepts of this sort[2]; 1004a and nearly all contraries are reducible to this source; but let us take them as having been investigated in the 'Selection of Contraries'[3].—And there are as many parts of philosophy as there are kinds of substance, so that there must necessarily be among them a first philosophy and one which follows this. For being and unity fall immediately into genera; and therefore the sciences too will correspond to these genera. For 'philosopher' is like 'mathematician' with its variety of meanings; for mathematics also has parts, and there is a first and a second science and other successive ones within the sphere of mathematics.[4]

Now since it is the work of one science to investigate opposites, and plurality is opposite to unity, and it belongs to one science to investigate the negation and the privation because in both cases we are really investigating unity, to which the negation or the privation refers (for we either say simply that unity is not present, or that it is not present in some particular class; in the latter case the characteristic difference of the class modifies the meaning of 'unity', as compared with the meaning conveyed in the bare negation; for the negation means just the absence of unity, while in privation there is also implied an underlying nature of which the privation is predicated[5]),—since, then, plurality is opposite to unity, in view of all these facts, the contraries of the concepts

[1] The argument is obscured by doubts as to the reading, but seems to be that being and unity are not severed from the particular thing which *is* and is one, and ∴ are not severed from one another.

[2] 1003b 36 read *τοιούτων· σχεδόν.*

[3] Fr. 1478b 36–1479a 5 (Fr. 31 ed. Rose, 1886).

[4] With 1004a 2–9 cf. B. 995b 10–13, 997a 15–25.

[5] i.e. negation is simply the negation of an attribute; in privation some member of a definite class is said not to have the attribute in the form appropriate to that class.

we named above, the other and the dissimilar and the unequal, and everything else which is derived either from these or from plurality and unity, must fall within the province of the science above-named.—And contrariety is one of these concepts, for contrariety is a kind of difference, and difference is a kind of otherness. Therefore, since there are many senses in which a thing is said to be one, these terms also will have many senses, but yet it belongs to one science to consider them all; for a term belongs to different sciences not if it has different senses, but if its definitions neither are identical nor can be referred to one central meaning. And since all things are referred to that which is primary, as for instance all things which are one are referred to the primary one, we must say that this holds good also of the same and the other and of contraries in general; so that after distinguishing the various senses of each, we must then explain by reference to what is primary in each term, saying how they are related to it; some in the sense that they possess it, others in the sense that they produce it, and others in other such ways.

It is evident then[1] that it belongs to one science to be able to give an account of these concepts as well as of substance. This was one of the questions in our book of problems.[2]

And it is the function of the philosopher to be able to investigate all things. For if it is not the function of the 1004b
philosopher, who is it who will inquire whether Socrates and Socrates seated are the same thing, or whether one thing has one contrary, or what contrariety is, or how many meanings it has? And similarly with all other such questions. Since, then, these are essential modifications of unity *qua* unity and of being *qua* being, not *qua* numbers or lines or fire, it is clear that it belongs to this science to investigate both the essence of these concepts and their properties. And those who study these properties err not by leaving the sphere of philosophy,[3] but by forgetting that substance, of which they have no correct idea, is prior to these other things. For number *qua*

[1] 1004a 32 omit ὅπερ . . . ἐλέχθη.
[2] i. e. B. 995b 20–27.
[3] Sc. which they do not do.

number has peculiar attributes, such as oddness and evenness, commensurability and equality, excess and defect, and these belong to numbers either in themselves or in relation to one another. And similarly the solid and the motionless and that which is in motion and the weightless and that which has weight have other peculiar properties. So too certain properties are peculiar to being as such, and it is about these that the philosopher has to investigate the truth.—An indication of this may be mentioned:—dialecticians and sophists assume the same guise as the philosopher, for sophistic is philosophy which exists only in semblance, and dialecticians [1] embrace all things in their dialectic, and being is common to all things; but evidently their dialectic embraces these subjects because these are proper to philosophy.—For sophistic and dialectic turn on the same class of things as philosophy, but this differs from dialectic in the nature of the faculty required and from sophistic in respect of the purpose of the philosophic life. Dialectic is merely critical where philosophy claims to know, and sophistic is what appears to be philosophy but is not.[2]

Again, in the list of contraries one of the two columns [3] is privative, and all contraries are reducible to being and non-being, and to unity and plurality, as for instance rest belongs to unity and movement to plurality. And nearly all thinkers agree that being and substance are composed of contraries; at least all name contraries as their first principles —some name odd and even, some hot and cold, some limit and the unlimited, some love and strife. And everything else is evidently reducible to unity and plurality (this reduction
1005a we must take for granted [4]), and the principles stated by other thinkers fall entirely under these as their genera. It is obvious then from these considerations too that it belongs to one science to examine being *qua* being. For all things are either contraries or composed of contraries, and unity and plurality are the starting-points of all contraries. And these belong to one science, whether they have or have not one

[1] 1004b 18 read ἡ γὰρ . . . διαλεκτικοὶ διαλέγονται περὶ ἁπάντων.
[2] With 1004b 5–26 cf. B. 995b 18–20, 997a 25–33.
[3] Cf. note on A. 986a 23.
[4] Cf. Fr. 1478b 36–1479a 5.

common notion. Probably they have not; yet even if 'one' has several meanings, the other meanings will be related to the primary meaning—and similarly in the case of the contraries. —And if[1] being or unity is not a universal and the same in every instance, or is not separable from the particular instances (as in fact it probably is not; the unity is in some cases that of common reference, in some cases that of serial succession),—just for this reason it does not belong to the geometer to inquire what is contrariety or completeness or being or unity or the same or the other, but only to presuppose these concepts and reason from this starting-point.—Obviously then it is the work of one science to examine being *qua* being, and the attributes which belong to it *qua* being, and the same science will examine not only substances but also their attributes, both those above named and the concepts 'prior' and 'posterior', genus and species, whole and part, and the others of this sort.[2]

CHAPTER III

We must state whether it belongs to one or to different sciences to inquire into the truths which are in mathematics called axioms, and into substance. Evidently the inquiry into these also belongs to one science, and that the science of the philosopher; for these truths hold good for everything that is, and not for some special genus apart from others. And all men use them, for they are true of being *qua* being, and each genus has being. But men use them just so far as to satisfy their purposes; that is, as far as the genus, whose attributes they are proving, extends. Therefore since these truths clearly hold good for all things *qua* being (for this is what is common to them), he who studies being *qua* being will inquire into them too.—And for this reason no one who is conducting a special inquiry tries to say anything about their truth or falsehood,—neither the geometer nor the arithmetician. Some natural philosophers indeed have done so, and their procedure was intelligible enough; for they thought that they alone

[1] 1005^a 8 omit καὶ διὰ τοῦτο.
[2] With ch. 2 cf. B. 995^b 5–7, 996^a 18–^{b} 26.

were inquiring about the whole of nature and of being. But since there is one kind of thinker who is even above the natural philosopher (for nature is only one particular genus of being), the discussion of these truths also will belong to him whose inquiry is universal and deals with primary
1005b substance. Physics also is a kind of Wisdom, but it is not the first kind.—And the attempts of some who discuss the terms on which truth should be accepted, are due to a want of training in logic; for they should know these things already when they come to a special study, and not be inquiring into them while they are pursuing it.—Evidently then the philosopher, who is studying the nature of all substance, must inquire also into the principles of syllogism.

But he who knows best about each genus must be able to state the most certain principles of his subject, so that he whose subject is being *qua* being must be able to state the most certain principles of all things. This is the philosopher, and the most certain principle of all is that regarding which it is impossible to be mistaken; for such a principle must be both the best known (for all men may be mistaken about things which they do not know), and non-hypothetical. For a principle which every one must have who knows anything about being, is not a hypothesis; and that which every one must know who knows anything, he must already have when he comes to a special study. Evidently then such a principle is the most certain of all; which principle this is, we proceed to say. It is, that the same attribute cannot at the same time belong and not belong to the same subject in the same respect; we must presuppose, in face of dialectical objections, any further qualifications which might be added. This, then, is the most certain of all principles, since it answers to the definition given above. For it is impossible for any one to believe the same thing to be and not to be, as some think Heraclitus says; for what a man says he does not necessarily believe. If it is impossible that contrary attributes should belong at the same time to the same subject (the usual qualifications must be presupposed in this premise too), and if an opinion which contradicts another is contrary to it, obviously it is impossible for the same man at the same time to believe the

same thing to be and not to be; for if a man were mistaken in this point he would have contrary opinions at the same time. It is for this reason that all who are carrying out a demonstration reduce it to this as an ultimate belief; for this is naturally the starting-point even for all the other axioms.[1]

CHAPTER IV

There are some who, as we have said, both themselves assert that it is possible for the same thing to be and not to be, and say that people can judge this to be the case. And 1006^a
among others many writers about nature use this language. But we have now posited that it is impossible for anything at the same time to be and not to be, and by this means have shown that this is the most indisputable of all principles.[2]—Some indeed demand that even this shall be demonstrated, but this they do through want of education, for not to know of what things one may demand demonstration, and of what one may not, argues simply want of education. For it is impossible that there should be demonstration of absolutely everything; there would be an infinite regress, so that there would still be no demonstration. But if there are things of which one should not demand demonstration, these persons cannot say what principle they regard as more indemonstrable than the present one.

We can, however, demonstrate negatively even that this view is impossible, if our opponent will only say something; and if he says nothing, it is absurd to attempt to reason with one who will not reason about anything, in so far as he refuses to reason. For such a man, as such, is seen already to be no better than a mere plant. Now negative demonstration I distinguish from demonstration proper, because in a demonstration one might be thought to be begging the question, but if another person is responsible for the assumption we shall have negative proof, not demonstration. The starting-

[1] With ch. 3 cf. B. 995^b 7–10, 996^b 26–997^a 15.

[2] i.e. we have shown that since *A* cannot be both *B* and not-*B*, no one can *think* *A* is both *B* and not-*B* (1005^b 22–31).

point for all such arguments is not the demand that our opponent shall say that something either is or is not (for this one might perhaps take to be a begging of the question), but that he shall say something which is significant both for himself and for another; for this is necessary, if he really is to say anything. For, if he means nothing, such a man will not be capable of reasoning, either with himself or with another. But if any one grants this, demonstration will be possible; for we shall already have something definite. The person responsible for the proof, however, is not he who demonstrates but he who listens; for while disowning reason he listens to reason. [And again he who admits this has admitted that something is true apart from demonstration, so that not everything will be 'so and not so'.[1]]

First then this at least is obviously true, that the word 'be' or 'not be' has a definite meaning, so that not everything will be 'so and not so'.—Again, if 'man' has one meaning, let this be 'two-footed animal'; by having one meaning I understand this:—if 'man' means '*X*', then if *A* is a man '*X*' will be what 'being a man' means for him. And it makes no difference even if one were to say a word has several
1006b meanings, if only they are limited in number; for to each formula there might be assigned a different word. For instance, we might say that 'man' has not one meaning but several, one of which would be defined as 'two-footed animal', while there might be also several other formulae if only they were limited in number; for a peculiar name might be assigned to each of the formulae. If, however, they were not limited but one were to say that the word has an infinite number of meanings, obviously reasoning would be impossible; for not to have one meaning is to have no meaning, and if words have no meaning reasoning with other people, and indeed with oneself, has been annihilated; for it is impossible to think of anything[2] if we do not think of one thing; but if this *is* possible, one name might be assigned to this thing. Let it be assumed then, as was said at the

[1] This sentence is probably out of place. For 'so and not so' cf. Pl. *Theaet.* 183 A.

[2] 1006b 10 read οὐδὲν γάρ.

beginning,[1] that the name has a meaning and has one meaning; it is impossible, then, that 'being a man' should mean precisely 'not being a man', if 'man' is not only predicable of one subject but also has one meaning (for we do not identify 'having one meaning' with 'being predicable of one subject', since on that assumption even 'musical' and 'white' and 'man' would have had one meaning, so that all things would have been one; for they would all have had the same meaning).

And it will not be possible for the same thing to be and not to be, except in virtue of an ambiguity, just as one whom we call 'man', others might call 'not-man'; but the point in question is not this, whether the same thing can at the same time be and not be a man in name, but whether it can in fact. Now if 'man' and 'not-man' mean nothing different, obviously 'not being a man' will mean nothing different from 'being a man'; so that 'being a man' will be 'not being a man'; for they will be one. For being one means this—what we find in the case of 'raiment' and 'dress'—viz. that the definitory formula is one. And if 'being a man' and 'not being a man' are to be one, they must mean one thing. But it was shown earlier that they mean different things. Therefore, if it is true to say of anything that it is a man, it must be a two-footed animal; for this was what 'man' meant; and if this is necessary, it is impossible that the same thing should not be a two-footed animal; for this is what 'being necessary' means—that it is impossible for the thing not to be. It is, then, impossible that it should be at the same time true to say the same thing is a man and is not a man.

The same account holds good with regard to 'not being man'[2], for 'being man' and 'being not-man' mean different 1007a
things, since even 'being white' and 'being man' are different; for the former terms are much more opposed, so that they must *a fortiori* mean different things. And if any one says that '*white*' means one and the same thing as 'man', again we shall say the same as what was said before, that it would follow that *all* things are one, and not only opposites. But if this is impossible, then what has been said will follow, if our opponent answers our question.

[1] a 31.   [2] 1007a I read μὴ εἶναι ἄνθρωπον.

And if, when one asks the question simply, he adds the contradictories, he is not answering the question. For there is nothing to prevent the same thing from being both man and white and countless other things: but still if one asks whether it is true to call this a man or not our opponent must give an answer which means one thing, and not add that it is also white and large. For, besides other reasons, it is impossible to enumerate the accidents, which are infinite in number; let him, then, enumerate either all or none. Similarly, therefore, even if the same thing is a thousand times man and not-man, we must not add, in answering the question whether this is a man, that it is also at the same time not a man, unless we are bound to add also all the other accidents, all that the subject is or is not; and if we do this, we are not observing the rules of argument.

And in general those who use this argument do away with substance and essence. For they must say that all attributes are accidents, and that there is no such thing as 'being essentially man' or 'animal'. For if there is to be any such thing as 'being essentially man' this will not be 'being not-man' or 'not being man' (yet these are negations of it[1]); for there was some one thing which it meant, and this was the substance of something. And denoting the substance of a thing means that the essence of the thing is nothing else. But if its being essentially man[2] is to be the same as either being essentially not-man or essentially not being man, then its essence *will* be something else. Therefore our opponents must say that there cannot be such a definition of anything, but that all attributes are accidental; for this is the distinction between substance and accident—'white' is accidental to man, because though he is white, whiteness is not his essence. But if *all* statements are accidental, there will be nothing primary about which they are made, if the accidental always implies predication about
1007b a subject. The predication, then, must go on *ad infinitum*. But this is impossible; for not even more than two terms can be combined in accidental predication. For (1) an accident is not an accident of an accident, unless it be because

[1] Sc. and hence (on the view attacked) should be compatible with it.
[2] 1007a 27 read εἰ δ' ἔσται αὐτῷ τὸ ὅπερ ἀνθρώπῳ εἶναι.

both are accidents of the same subject. I mean, for instance, the white is musical and the latter is white, only because both are accidental to man. But (2) Socrates is musical, not in this sense, that both terms are accidental to something else. Since then some predicates are accidental in this and some in that sense, (*a*) those which are accidental in the latter sense, in which white is accidental to Socrates, cannot form an infinite series in the upward direction,[1]—e. g. Socrates the white has not yet another accident; for no unity can be got out of such a sum. Nor again (*b*) will 'white' have another term accidental to it, e. g. 'musical'. For this is no more accidental to that than that is to this; and at the same time we have drawn the distinction, that while some predicates are accidental in this sense, others are so in the sense in which 'musical' is accidental to Socrates; and the accident is an accident of an accident not in cases of the latter kind, but only in cases of the other kind, so that not *all* terms will be accidental.[2] There must, then, be something which denotes substance. And it has been shown that, if this is so, contradictory statements cannot be predicated at the same time.

Again, if all contradictory statements are true of the same subject at the same time, evidently all things will be one. For the same thing will be a trireme, a wall, and a man, if it is equally possible to affirm and to deny anything of anything,—and this premise must be accepted by those who share the views of Protagoras. For if any one thinks that the man is not a trireme, evidently he is not a trireme; so that he also is a trireme, if, as they say, contradictory statements are both true. And we thus get the doctrine of Anaxagoras,[3] that all things are mixed together; so that nothing really exists. They seem, then, to be speaking of the indeterminate, and, while fancying themselves to be speaking of being, they are speaking about non-being; for that which exists potentially and not actually is the indeterminate. But they must

[1] i. e. in the direction of predicates, which are naturally wider or higher than the subject.

[2] Sense (1) reduces to sense (2), and in this an infinite number of accidents combined together is impossible; there must be substance somewhere.

[3] Fr. 1 Diels, *Vorsokratiker*.

predicate of every subject every attribute and the negation of it indifferently. For it is absurd if of every subject its own negation is to be predicable, while the negation of something else which cannot be predicated of it is not predicable of it; for instance, if it is true to say of a man that he is not a man, evidently it is also true to say that he is not a trireme. If, then, the affirmative[1] can be predicated, the negative must be predicable too; and if the affirmative is not predicable, the negative, at least, will be more predicable than
1008a the negative of the subject itself. If, then, even the latter negative is predicable, the negative of 'trireme' will be also predicable; and, if this is predicable, the affirmative will be so too.—Those, then, who maintain this view are driven to this conclusion, and to the further conclusion that it is not necessary either to assert or to deny. For if it is true that a thing is man and not-man, evidently also it will be neither man nor not-man. For to the two assertions there answer two negations. And if the former[2] is treated as a single proposition compounded out of two, the latter also is a single proposition opposite to the former.

Again, either the theory is true in all cases, and a thing is both white and not-white, and being and non-being, and all other contradictories are similarly compatible, or the theory is true of some statements and not of others. And if not of all, the exceptions will be contradictories of which admittedly only one is true; but if of all, again either the negation will be true wherever the assertion is, and the assertion true wherever the negation is, or the negation will be true where the assertion is, but the assertion not always true where the negation is. And (1) in the latter case there will be something which fixedly *is not*, and this will be an indisputable belief; and if non-being is indisputable and knowable, the opposite assertion will be more knowable. But (2) if what it is necessary to deny it is equally necessary to assert, it is either[3] true or not true to separate the predicates and say, for instance, that a thing is white, and again that it is not-white. And if (*a*) it is

[1] Sc. 'trireme'.
[2] Sc. that the thing is man and not-man.
[3] 1008a 18 read καὶ ὅσα ἀποφῆσαι φάναι ἀνάγκη, ἤτοι.

not true to apply the predicates separately, our opponent is not really applying them, and nothing at all exists; but how could non-existent things speak or walk, as he does? Also all things will on this view be one, as has been already said, and man and God and trireme and their contradictories will be the same. For if contradictories can be predicated alike of each subject, one thing will in no wise differ from another; for if it differ, this difference will be something true and peculiar to it. And (*b*) if one may with truth apply the predicates separately, the above-mentioned result follows none the less.

Further, it follows that all would then be right and all would be in error, and our opponent himself confesses himself to be in error.—And at the same time our discussion with him is evidently about nothing at all; for he says nothing. For he says neither 'yes' nor 'no', but both 'yes' and 'no'; and again he denies both of these and says 'neither yes nor no'; for otherwise there would already be something definite.—Again, if when the assertion is true, the negation is false, and when this is true, the affirmation is false, it will not be possible to assert and deny the same thing truly at the same time. But perhaps they might say we had assumed 1008b
the very question at issue.

Again, is he in error who judges either that the thing is so or that it is not so, and is he right who judges both? If he is not right, what can they mean by saying that the nature of existing things is of this kind? And if he is not right, but more right than he who judges in the other way, being will already be of a definite nature, and this will be true, and not at the same time also not true. But if all are alike both right and wrong, one who believes this can neither speak nor say anything intelligible; for he says at the same time both 'yes' and 'no'. And if he makes no judgement but 'thinks' and 'does not think', indifferently, what difference will there be between him and the plants?—Thus, then, it is in the highest degree evident that neither any one of those who maintain this view nor any one else is really in this position. For why does a man walk to Megara and not stay at home thinking he is walking? Why does he not walk early some morning into a well or

over a precipice, if one happens to be in his way? Why do we observe him guarding against this, evidently not thinking that falling in is alike good and not good? Evidently he judges one thing to be better and another worse. And if this is so, he must judge one thing to be man and another to be not-man, one thing to be sweet and another to be not-sweet. For he does not aim at and judge all things alike, when, thinking it desirable to drink water or to see a man, he proceeds to aim at these things; yet he ought, if the same thing were alike man and not-man. But, as was said, there is no one who does not obviously avoid some things and not others. Therefore, as it seems, all men make unqualified judgements, if not about all things, still about what is better and worse. And if this is not knowledge but opinion, they should be all the more anxious about the truth, as a sick man should be more anxious about his health than one who is healthy; for he who has opinions is, in comparison with the man who knows, not in a healthy state as far as the truth is concerned.

Again, however much all things may be 'so and not so', still there is a more and a less in the nature of things; for we should not say that two and three are equally even, nor is he who thinks four things are five equally wrong with him who thinks they are a thousand. If then they are not equally wrong, obviously one is less wrong and therefore more right. If then that which has more of any quality is nearer the
1009a norm, there must be some truth to which the more true is nearer. And even if there is not, still there is already something more certain and true, and we shall have got rid of the unqualified doctrine which would prevent us from determining anything in our thought.

CHAPTER V

Again, from the same opinion proceeds the doctrine of Protagoras, and both doctrines must be alike true or alike untrue. For on the one hand, if all opinions and appearances are true, all statements must be at the same time true and false. For many men hold beliefs in which they conflict

with one another, and all think those mistaken who have not the same opinions as themselves; so that the same thing must be and not be. And on the other hand, if this is so, all opinions must be true; for those who are mistaken and those who are right are opposed to one another in their opinions; if, then, reality is such as the view in question supposes, all will be right in their beliefs. Evidently, then, both doctrines proceed from the same way of thinking.

But the same method of discussion must not be used with all opponents; for some need persuasion, and others compulsion. Those who have been driven to this position by difficulties in their thinking can easily be cured of their ignorance; for it is not their expressed argument but their thought that one has to meet. But those who argue for the sake of argument can be convinced only by emending the argument as expressed in words.

Those who really feel the difficulties have been led to this opinion by observation of the sensible world. (1) They think that contradictions or contraries are true at the same time, because they see contraries coming into existence out of the same thing. If, then, that which is not cannot come to be, the thing must have existed before as both contraries alike, as Anaxagoras says all is mixed in all, and Democritus too; for *he* says the void and the full exist alike in every part, and yet one of these is being, and the other non-being. To those, then, whose belief rests on these grounds, we shall say that in a sense they speak rightly and in a sense they err. For 'that which is' has two meanings, so that in some sense a thing can come to be out of that which is not, while in some sense it cannot, and the same thing can at the same time be and not be—but not in the same respect. For the same thing can be potentially at the same time two contraries, but it cannot actually. And again we shall ask them to believe that among existing things there is another kind of substance to which neither movement nor destruction nor generation at all belongs.

And (2) similarly some have inferred from the sensible world 1009b
'the truth of appearances'. For they think that the truth should not be determined by the large or small number of those who

hold a belief, and that the same thing is thought sweet by some who taste it, and bitter by others, so that if all were ill or all were mad, and only two or three were well or sane, these would be thought ill and mad, and not the others. And again, many of the other animals receive about the same things impressions contrary to ours; and even to the senses of each individual, things do not always seem the same. Which, then, of these impressions are true and which are false is not obvious; for the one set is no more true than the other, but both are alike. And this is why Democritus, at any rate, says that either there is no truth or to us at least it is not evident. And in general it is because these thinkers suppose knowledge to be sensation, and this to be a physical alteration, that they say that what appears to our senses must be true; for it is for these reasons that Empedocles and Democritus and, one may almost say, all the others have fallen victims to opinions of this sort. For Empedocles says that when men change their condition they change their knowledge;

> For wisdom increases in men according to their present state.[1]

And elsewhere he says:

> So far as their nature changes, so far to them always
> Come changed thoughts into mind.[2]

And Parmenides also expresses himself in the same way:

> For as in each case the much-bent limbs are composed,
> So is the mind of men; for in each and all men
> 'Tis one thing thinks—the substance of their limbs:
> For that of which there is more is thought.[3]

A saying of Anaxagoras to some of his friends is also related,—that things would be for them such as they supposed them to be. And they say that Homer also evidently had this opinion, because he made Hector, when he was unconscious from the blow, lie 'thinking other thoughts',—which implies that even those who are bereft of thought have thoughts, though not the same. Evidently, then, if both are forms of thought, the real things also are at the same time 'so and not

[1] Fr. 106 Diels, *Vorsokratiker*. [2] Fr. 108 Diels, *ib.*
[3] Fr. 16 Diels, *ib.*

so'. And it is in this direction that the consequences are most difficult. For if those who have seen most of what truth is possible for us (and these are those who seek and love it most)—if these have such opinions and express these views about the truth, is it not natural that beginners in philosophy should lose heart? For to seek the truth would be to follow flying game.

But the reason for this opinion is that while these thinkers 1010a were inquiring into the truth of that which is, they thought 'that which is' was identical with the sensible world; in this, however, there is largely present the nature of the indeterminate—of that which exists in the peculiar sense which we have explained;[1] and, therefore, while they speak plausibly, they do not say what is true. For it befits us to put the matter so rather than as Epicharmus put it against Xenophanes.[2] And again, they held these views because they saw that all this world of nature is in movement, and that about that which changes no true statement can be made; at least, regarding that which everywhere in every respect is changing nothing could truly be affirmed. It was this belief that blossomed into the most extreme of the views above mentioned, that of the professed Heracliteans, such as was held by Cratylus, who finally did not think it right to say anything but only moved his finger, and criticized Heraclitus for saying that it is impossible to step twice into the same river; for *he* thought one could not do it even once.

But we shall say in answer to this argument also, that there is some real sense in their thinking that the changing, when it is changing, does not exist. Yet it is after all disputable; for that which is losing a quality has something[3] of that which is being lost, and of that which is coming to be, something must already be. And in general if a thing is perishing, there will be present something that exists; and if a thing is coming to be, there must be something from which it comes to be and something by which it is generated, and this process cannot be[4] *ad infinitum*. But leaving these arguments, let us insist

[1] Cf. 1009a 32.

[2] Epicharmus may have said that Xenophanes' views were 'neither true nor plausible', or that they were 'true but not plausible'.

[3] 1010a 18 read ἔχει τι τοῦ.

[4] 1010a 22 read μὴ εἶναι εἰς.

on this, that it is not the same thing to change in quantity and in quality. Grant that in quantity a thing is not constant; still it is in respect of its form that we know each thing.—And again, it would be fair to criticize those who hold this view for asserting about the whole material universe what they saw only in a minority even of sensible things. For only that region of the sensible world which immediately surrounds us is always in process of destruction and generation; but this is—so to speak—not even a fraction of the whole, so that it would have been juster to acquit this part of the world because of the other part, than to condemn the other because of this. And again, obviously we shall make to them also the same reply that we made before;[1] we must show them and persuade them that there is something whose nature is changeless. Indeed, from the assertion that things at the same time are and are not, there follows the assertion that all things are at rest rather than that they are in movement; for there is nothing into which they can change, since all attributes belong already to all subjects.

1010b Regarding the nature of truth, we must maintain that not everything which appears is true. Firstly, they contend that sensation—at least of the object peculiar to the sense in question—is not false; we answer that appearance is not the same as sensation.—Again, it is fair to express surprise at our opponents for raising the question whether magnitudes are as great, and colours are of such a nature, as they appear to people at a distance, or as they appear to those close at hand, and whether they are such as they appear to the sick or to the healthy, and whether those things are heavy which appear so to the weak or those which appear so to the strong, and whether truth is what appears to the sleeping or to the waking. For obviously they do not think these to be open questions; no one, at least, if when he is in Libya he fancies one night that he is in Athens, straightway starts for the Odeum. And again with regard to the future, as Plato says,[2] surely the opinion of the physician and that of the ignorant man are not equally weighty, for instance, on the question whether a man will get well or not.—And again, among sensa-

[1] Cf. 1009a 36.

[2] Cf. *Theaetetus* 171 E, 178 C.

tions themselves the sensation of a foreign object and that of the appropriate object, or that of a kindred object and that of the object of the sense in question,[1] are not equally authoritative, but in the case of colour, sight, not taste, has the authority, and in the case of flavour, taste, not sight; each of which senses never says at the same moment of the same object that it at the same time is 'so and not so'.—But not even at different moments does one sense disagree about the quality, but only about that to which the quality belongs. I mean, for instance, the same wine might seem, if either it or one's body changed, at one time sweet and at another time not sweet; but at least the sweet, such as it is when it exists, has never yet changed, but one is always right about it, and that which is to be sweet must of necessity be of such and such a nature. Yet all these views destroy this distinction, so that as there is no essence of anything, so nothing is of necessity; for the necessary cannot be in this way and also in that, so that if anything is of necessity, it will not be both 'so and not so'.

And, in general, if only the sensible exists, there would be nothing if animate things were not; for there would be no faculty of sense. The view that the sensations also would not exist is doubtless true (for they are affections of the perceiver), but that the substrata which cause the sensation should not exist even apart from sensation is impossible. For sensation is surely not the sensation of itself, but there is something beyond the sensation, which must be prior to the sensation; for that which moves is prior in nature to that which is moved, and if they are correlative terms, this is 1011a
no less the case.

CHAPTER VI

There are, both among those who have these convictions and among those who merely profess these views, some who raise a difficulty by asking, who is the judge of the healthy

[1] 1010b 16 read αὐτῆς. E.g. the knowledge which smell gives us of savour and of odour respectively.

man, and in general who is likely to judge rightly on each class of questions. But such inquiries are like puzzling over the question whether we are now asleep or awake. And all such questions have the same meaning. These people demand that a reason shall be given for everything; for they seek a starting-point, and they wish to get this by demonstration, while it is obvious from their actions that they have no conviction. But their mistake is what we have stated it to be; they seek a reason for that for which no reason can be given; for the starting-point of demonstration is not demonstration.

These, then, might be easily persuaded of this truth, for it is not difficult to grasp; but those who seek merely compulsion in argument seek what is impossible; for they demand to be made to contradict themselves, while they are contradicting themselves from the very first.—But if not all things are relative, but some are self-existent, not everything that appears will be true; for that which appears appears to some one; so that he who says all things that appear are true, makes all things relative. And, therefore, those who ask for an irresistible argument, and at the same time demand to be called to account for their views, must guard themselves by saying that the truth is not that what appears exists, but that what appears exists *for him to whom* it appears, and *when*, and *in the sense in which*, and *in the way in which* it appears. And if they give an account of their view, but do not give it in this way, they will soon find themselves contradicting themselves. For it is possible that a thing may for the same man appear as honey to the sight, but not to the taste, and that, as we have two eyes, things may not appear the same to each, if the eyes are unlike. For to those who for the reasons named above[1] say that what appears is true, and therefore that all things are alike false and true, for things do not appear either the same to all men or always the same to the same man, but often have contrary appearances at the same time (for touch says there are two objects when we cross our fingers, while sight says there is one),—to these we shall say 'yes, but not to the same sense and in the same part of it and in the same way and

[1] Cf. 1009ᵇ 1.

at the same time', so that what appears *is* under these qualifications true. But perhaps for this reason those who argue thus 1011b not because they feel a difficulty but for the sake of argument, should say that this is not true, but true for this man. And as has been already said, they must make everything relative —relative to thought and perception, so that nothing either has come to be or will be without some one's first thinking so. But if things *have* come to be or will be,[1] evidently not all things will be relative to opinion.—Again, if a thing is one, it is in relation to one thing or to a definite number of things; and if the same thing is both half and equal, still the equal is not correlative to the double.[2] If, then, the same thing is a man, in relation to that which thinks, and is that which is thought, in relation to that which thinks, that which *thinks* will not be a man, but only that which *is thought*. Again, if each thing is to be relative to that which thinks, that which thinks will be relative to an infinity of specifically different things.

Let this, then, suffice to show (1) that the most indisputable of all beliefs is that contradictory statements are not at the same time true, and (2) what consequences follow from the denial of this belief, and (3) why people do deny it. Now since it is impossible that contradictories should be at the same time true of the same thing, obviously contraries also cannot belong at the same time to the same thing. For of the contraries, no less than of the contradictories, one is a privation—and a privation of substance; and privation is the denial of a predicate to a determinate genus. If, then, it is impossible to affirm and deny truly at the same time, it is also impossible that contraries should belong to a subject at the same time, unless both belong to it in particular relations, or one in a particular relation and one without qualification.

CHAPTER VII

But on the other hand there cannot be an intermediate between contradictories, but of one subject we must either affirm or deny any one predicate. This is clear, in the first

[1] Sc. without some one's first thinking so.
[2] Sc. but the equal to the equal, the half to the double.

place, if we define what the true and the false are. To say of what is that it is not, or of what is not that it is, is false, while to say of what is that it is, and of what is not that it is not, is true; so that he who says of anything that it is, or that it is not, will say either what is true or what is false; but neither what is nor what is not is said to be or not to be.[1]—Again, either the intermediate between the contradictories will be so in the way in which grey is between black and white,[2] or as that which is neither man nor horse is between man and horse. (1) If it were of the latter kind, it could not change into the extremes, for change is from not-good to good, or from good to not-good (but as a matter of fact when there is an intermediate it is always observed to change into the extremes). For there is no change except to opposites[3] and to their intermediate. (2) But if it is really intermediate,[4] in this way too there is a difficulty—there would have to be
1012a a change to white, which was not from not-white; but as it is, this is never seen.—Again, the understanding either affirms or denies every object of understanding or reason; this becomes obvious if we define when thought is true and when false. When it connects in one way by assertion or negation, it is true, and when it does so in the other way, it is false.—Again, there must be an intermediate between *all* contradictories, if one is not arguing merely for the sake of argument; so that it will be possible for a man to say what is neither true nor untrue. And there will be a middle between that which is and that which is not, so that there will also be a kind of change intermediate between generation and destruction.—Again, in all classes in which the negation of an attribute means the assertion of its contrary, even in these there will be an intermediate; for instance, in the sphere of numbers there will be number which is neither odd nor not-odd. But this is impossible, as is obvious from the definition.—Again, the process will go on *ad infinitum*, and the number

[1] Sc. by those who say there is an intermediate between contradictories. Hence such a statement is neither true nor false, which is absurd.

[2] Though of course it differs from this case in being between contradictories, not contraries.

[3] Sc. contrary, not contradictory opposites.

[4] Sc. as grey is between black and white.

of realities will be not only made half as great again, but even greater. For again it will be possible to deny this intermediate with reference both to its assertion and to its negation,[1] and this new term will be some definite thing; for its essence is something different.—Again, when a man, on being asked whether a thing is white, says 'no', he has denied nothing except that it is; and its not being is a negation.

Some people have acquired this opinion as other paradoxical opinions have been acquired; when men cannot refute eristical arguments, they give in to the argument and agree that the conclusion is true. This, then, is why some argue in such fashion; others do so because they demand a reason for everything. And the starting-point in dealing with all such people is definition. Now the definition rests on the necessity of their meaning something; for the formula, of which the word is a sign, becomes its definition.—The doctrine of Heraclitus, that all things are and are not, seems to make everything true, while that of Anaxagoras, that there is an intermediate between the terms of a contradiction, seems to make everything false[2]; for when things are mixed, the mixture is neither good nor not-good, so that one cannot say anything that is true.

CHAPTER VIII

In view of these distinctions it is obvious that the one-sided theories which some people express about all things cannot be valid—on the one hand the theory that nothing is true (for, say they, there is nothing to prevent every statement from being like the statement 'the diagonal of a square is commensurate with the side'),—on the other hand the theory that everything is true.—These views are practically the same as that of Heraclitus; for that which says that 'all things are true and all are false' also makes each of these statements separately, so that since they are impossible, the double state- 1012b
ment must be impossible too.—Again, there are obviously contradictories which cannot be at the same time true. Nor

[1] i.e. if there is a term *B* which is neither *A* nor not-*A*, there will be a new term *C* which is neither *B* nor not-*B*.

[2] 1012a 27 omit ὥστε.

on the other hand can all statements be false; yet this would *seem* more possible in view of what has been said.—But against all such arguments we must postulate, as we said above,[1] not that something is or is not, but that people mean something, so that we must argue from a definition, having got what falsity or truth means. If that which it is true to affirm is nothing other than that which it is false to deny,[2] it is impossible that all statements should be false; for one side of the contradiction must be true.—Again, if it is necessary with regard to everything either to assert or to deny it, it is impossible that both should be false; for it is *one* side of the contradiction that is false.—Further, all such arguments are exposed to the often-expressed objection, that they destroy themselves. For he who says that everything is true makes the statement contrary to his own also true, so that his own is not true (for the contrary statement denies that it is true), while he who says everything is false makes himself also false.—And if the former person excepts the contrary statement, saying it alone is not true, while the latter excepts his own as being alone not false, none the less they are driven to postulate the truth or falsehood of an infinite number of statements; for that which says the true statement is true, is true, and this process will go on to infinity.

Evidently again those who say all things are at rest are not right, nor are those who say all things are in movement. For if all things are at rest, the same statements will always be true and the same always false,—but they obviously are not; for he who makes a statement himself at one time was not and again will not be. And if all things are in motion, nothing will be true; everything therefore will be false. But it has been shown that this is impossible. Again, it must be that which is that changes; for change is from something to something. But again it is not the case that all things are at rest or in motion *sometimes*, and nothing *for ever*; for there is something which always moves the things that are in motion, and the first mover must itself be unmoved.

[1] Cf. 1006a 18.

[2] 1012b 9 read ἄλλο τὸ ἀληθὲς φάναι ἢ ⟨ὃ⟩ ἀποφάναι ψεῦδος. So perhaps Asclepius.

BOOK V (Δ)

CHAPTER I

'Beginning' means (1) that part of a thing from which one would start first, e.g. a line or a road has a beginning in either of the contrary directions. (2) That from which each 1013a
thing would best be originated, e.g. we must sometimes begin to learn not from the first point and the beginning of the thing, but from the point from which we should learn most easily. (3) That from which (as an immanent part) a thing first arises, e.g. as the keel of a ship and the foundation of a house, while in animals some suppose the heart, others the brain, others some other part, to be of this nature. (4) That from which (*not* as an immanent part) a thing first arises, and from which the movement or the change naturally first proceeds, as a child comes from the father and the mother, and a fight from abusive language. (5) That at whose will that which is moved is moved and that which changes changes, e.g. the magistracies in cities, and oligarchies and monarchies and tyrannies, are called *ἀρχαί*,[1] and so are the arts, and of these especially the architectonic arts. (6) That from which a thing can first be known; for this also[2] is called the beginning of the thing, e.g. the hypotheses are the beginnings of demonstrations. (Causes are spoken of in an equal number of senses; for all causes are beginnings.) It is common, then, to all beginnings to be the first point from which a thing either is or comes to be or is known; but of these some are immanent in the thing and others are outside. Therefore the nature of a thing is a beginning, and so are the elements of a thing, and thought and will, and essence, and the final cause—for the

[1] The double meaning of ἀρχή—'beginning' and 'government'—cannot be reproduced in English.
[2] 1013a 15 read καὶ γὰρ αὕτη.

good and the beautiful are the beginning both of the knowledge and of the movement of many things.

CHAPTER II

'Cause' means (1) that from which (as immanent material) a thing comes into being, e.g. the bronze of the statue and the silver of the saucer, and the classes which include these. (2) The form or pattern, i.e. the formula of the essence, and the classes which include this (e.g. the ratio 2 : 1 and number in general are causes of the octave) and the parts of the formula. (3) That from which the change or the freedom from change first begins, e.g. the adviser is a cause of the action, and the father a cause of the child, and in general the maker a cause of the thing made and the change-producing of the changing. (4) The end, i.e. that for the sake of which a thing is, e.g. health is the cause of walking. For why does one walk? We say 'that one may be healthy', and in speaking thus we think we have given the cause. The same is true of all the means that intervene before the end, when something
1013b else has put the process in motion (as e.g. thinning or purging or drugs or instruments intervene before health is reached); for all these are for the sake of the end, though they differ from one another in that some are instruments and others are actions.

These, then, are practically all the senses in which causes are spoken of, and as they are spoken of in several senses it follows that there are several causes of the same thing, and in no accidental sense, e.g. both the art of sculpture and the bronze are causes of the statue not in virtue of anything else but *qua* statue; not, however, in the same way, but the one as matter and the other as source of the movement. And things can be causes of one another, e.g. exercise of good condition, and the latter of exercise; not, however, in the same way, but the one as end and the other as source of movement.—Again, the same thing is sometimes cause of contraries; for that which when present causes a particular thing, we sometimes charge, when absent, with the contrary, e.g. we impute the shipwreck to the absence of the steers-

man, whose presence was the cause of safety; and both—the presence and the privation—are causes as sources of movement.

All the causes now mentioned fall under four senses which are the most obvious. For the letters are the causes of syllables, and the material is the cause of manufactured things, and fire and earth and all such things are the causes of bodies, and the parts are causes of the whole, and the hypotheses are causes of the conclusion, in the sense that they are that out of which these respectively are made; but of these some are cause as *substratum* (e.g. the parts), others as *essence* (the whole, the synthesis, and the form). The semen, the physician, the adviser, and in general the agent, are all *sources of change* or of rest. The remainder are causes as the *end* and the good of the other things; for that, for the sake of which other things are, is naturally the best and the end of the other things; let us take it as making no difference whether we call it good or apparent good.

These, then, are the causes, and this is the number of their kinds, but the *varieties* of causes are many in number, though when summarized these also are comparatively few. Causes are spoken of in many senses, and even of those which are of the same kind some are causes in a prior and others in a posterior sense, e.g. both 'the physician' and 'the professional man' are causes of health, and 'the ratio 2 : 1' and 'number' are causes of the octave, and the classes that include any particular cause are always causes of the particular effect. Again, there are accidental causes and the classes which include these, e.g. while in one sense 'the sculptor' causes the statue, in another sense 'Polyclitus' causes it, because the sculptor happens to be Polyclitus; and the classes that include the accidental cause are also causes, e.g. 'man'—or in general 'animal'—is the cause of the statue, because Polyclitus is a man, and a man is an animal. Of accidental causes also some are more remote or nearer than others, as, for instance, if 'the white' and 'the musical' were called causes of the statue, and not only 'Polyclitus' or 'man'. But besides all these varieties of causes,[1] whether proper or accidental, some

[1] 1014a 7 retain παρά.

are called causes as being able to act, others as acting, e.g. the cause of the house's being built is the builder, or the builder when building.—The same variety of language will be found with regard to the effects of causes, e.g. a thing may be called the cause of this statue or of a statue or in general of an image, and of this bronze[1] or of bronze or of matter in general; and similarly in the case of accidental effects. Again, both accidental and proper causes may be spoken of in combination, e.g. we may say not 'Polyclitus' nor 'the sculptor', but 'Polyclitus the sculptor'.

Yet all these are but six in number, while each is spoken of in two ways; for (1) they are causes either as the individual, or as the class that includes the individual,[2] or as the accidental, or as the class that includes the accidental, and these either as combined,[3] or as taken simply; and (2) all may be taken as acting or as having a capacity. But they differ inasmuch as the acting causes and the individuals exist, or do not exist, simultaneously with the things of which they are causes, e.g. this particular man who is curing, with this particular man who is recovering health, and this particular builder with this particular thing that is being built; but the potential causes are not always in this case; for the house does not perish at the same time as the builder.[4]

CHAPTER III

'Element' means the primary component immanent in a thing, and indivisible in kind into other kinds, e.g. the elements of speech are the parts of which speech consists and into which it is ultimately divided, while *they* are no longer divided into other forms of speech different in kind from them. If they *are* divided, their parts are of the same kind, as a part of water is water (while a part of the syllable is not a syllable). Similarly those who speak of the elements of bodies mean the things into which bodies are ultimately

[1] For this way of speaking cf. *Phys.* II. 194a 33.
[2] 1014a 17 for αὐτοῦ read τοῦ καθ' ἕκαστον.
[3] Sc. the particular proper cause with the particular accidental, or the general proper with the general accidental.
[4] With this chapter cf. *Phys.* II. 3.

divided, while *they* are no longer divided into other things differing in kind; and whether the things of this sort are one or more, they call these elements. The elements of geometrical proofs, and in general the elements of demonstrations, have a similar character; for the primary demonstrations, each of which is implied in many demonstrations, are called elements 1014b of demonstrations; and the primary syllogisms, which have three terms and proceed by means of one middle, are of this nature.

People also transfer the word 'element' from this meaning and apply it to that which, being one and small, is useful for many purposes; for which reason the small and simple and indivisible is called an element. Hence come the facts that the most universal things are elements (because each of them being one and simple is present in a plurality of things, either in all or in as many as possible[1]), and[2] that unity and the point are thought by some to be first principles. Now, since the so-called genera are universal and indivisible (for there is no analytic formula of them), some say the genera are elements, and more so than the differentia, because the genus is more universal; for where the differentia is present, the genus accompanies it, but where the genus is, the differentia is not always. It is common to all the meanings that the element of each thing is the first component immanent in each.

CHAPTER IV

'Nature' means (1) the genesis of growing things—the meaning which would be suggested if one were to pronounce the υ in φύσις long.[3] (2) The primary immanent element in a thing, from which its growth proceeds. (3) The source from which the primary movement in each natural object is present in it in virtue of its own essence. Those things are said to grow which derive increase from something else by

[1] ἢ ὅτι πλείστοις shows that A. is not thinking of the strict universals of science but of the rough generalizations of dialectic. Cf. the use of στοιχεῖον in the *Topics*, and Diels, *Elementum*, p. 29.

[2] 1014b 8 omit διό.

[3] This (i.e. 'growth') is the etymological sense of φύσις. φύεσθαι, 'to grow,' has υ long in most of its forms.

contact and organic unity, or organic adhesion as in the case of embryos. Organic unity differs from contact; for in the latter case there need not be anything besides the contact, but in organic unities there is something identical in both parts, which makes them grow together instead of merely touching, and be one in respect of continuity and quantity, though not of quality.—(4) 'Nature' means the primary matter of which any non-natural object consists or out of which it is made, which cannot be modified or changed from its own potency, as e.g. bronze is said to be the nature of a statue and of bronze utensils, and wood the nature of wooden things; and so in all other cases; for when a product is made out of these materials, the first matter is preserved throughout. In this way people call the elements of *natural* objects also their nature, some naming fire, others earth, others air, others water, others something else of the sort, and some naming more than one of these, and others all of them.—(5) 'Nature' means the *essence* of natural objects, as with those who say the nature is the primary mode of composition, or as Empedocles[1] says:—

1015a Nothing that is has a nature,
But only mixing and parting of the mixed,
And nature is but a name applied to them by men.

Hence as regards the things that are or come to be by nature, though that *from which* they naturally come to be or are is already present, we say they have not their nature yet, unless they have their form or shape. That which comprises both of these—matter and form—exists *by* nature, e.g. the animals and their parts; and nature is both the first matter (and this in two senses, either first, counting from the thing, or first in general, e.g. in the case of works in bronze, bronze is first with reference to them, but in general perhaps water is first, if all things that can be melted are water), and the form or essence, which is the end of the process of becoming. And from this sense of 'nature' every essence in general is in fact, by an extension of meaning, called a 'nature', because the nature of a thing is one kind of essence.

From what has been said, then, it is plain that nature in the

[1] Fr. 8 Diels, *Vorsokratiker*.

primary and strict sense is the essence of things which have in themselves, as such, a source of movement; for the matter is called the nature because it is qualified to receive this, and processes of becoming and growing are called nature because they are movements proceeding from this. And nature in this sense is the source of the movement of natural objects, being present in them somehow, either potentially or actually.

CHAPTER V

'The necessary' means (1) that without which, as a condition, a thing cannot live, e.g. breathing and food are necessary for an animal; for it is incapable of existing without these.—(2) The conditions without which good cannot be or come to be, or without which we cannot get rid or be freed of evil, e.g. drinking the medicine is necessary in order that we may be cured of disease, and sailing to Aegina is necessary in order that we may get our money.—(3) The compulsory and compulsion, i.e. that which impedes and hinders contrary to impulse and purpose. For the compulsory is called necessary; whence the necessary is painful, as Evenus[1] says: 'For every necessary thing is ever irksome.' And compulsion is a form of necessity, as Sophocles[2] says: 'Force makes this action a necessity.' And necessity is held to be something that cannot be persuaded—and rightly, for it is contrary to the movement which accords with purpose and with reasoning.—(4) We say that that which cannot be otherwise is necessarily so. And from this sense of 'necessary' all the others are somehow derived; for as regards the compulsory we say that it is necessary to act or to be acted on, only when we cannot act according 1015b
to impulse because of the compelling force,—which implies that necessity is that because of which the thing cannot be otherwise; and similarly as regards the conditions of life and of good, when in the one case good, in the other life and being, are not possible without certain conditions, these are necessary, and this cause is a kind of necessity.—Again, (5) demonstration is a necessary thing, because the conclusion cannot be otherwise, if there has been demonstration in the full sense; and

[1] Fr. 8 Hiller. [2] *Electra* 256.

the causes of this necessity are the first premises, i.e. the fact that the propositions from which the syllogism proceeds cannot be otherwise.

Now some things owe their necessity to something other than themselves; others do not, while they are the source of necessity in other things. Therefore the necessary in the primary and strict sense is the simple; for this does not admit of more states than one, so that it does not admit even of one state and another; for already it would admit of more than one. If, then, there are certain eternal and unmovable things, nothing compulsory or against their nature attaches to them.

CHAPTER VI

'One' means (1) that which is one by accident, (2) that which is one by its own nature. (1) Instances of the accidentally one are 'Coriscus' and 'musical', and 'musical Coriscus' (for it is the same thing to say 'Coriscus' and 'musical', and 'musical Coriscus'), and 'musical' and 'just', and 'musical Coriscus' and 'just Coriscus'. For all these are called one by accident, 'just' and 'musical' because they are accidents of one substance, 'musical' and 'Coriscus' because the one is an accident of the other; and similarly in a sense 'musical Coriscus' is one with 'Coriscus', because one of the parts of the concept is an accident of the other, i.e. 'musical' is an accident of Coriscus; and 'musical Coriscus' is one with 'just Coriscus', because both have parts which are accidents of one and the same subject. The case is similar if the accident is predicated of a class or of any universal term, e.g. if one says that man is the same as 'musical man'; for this is either because 'musical' is an accident of man, which is one substance, or because both are accidents of some individual, e.g. Coriscus. Both, however, do not belong to him in the same way, but one doubtless as genus and in the substance, the other as a state or affection of the substance.

The things, then, that are called one by accident, are called so in this way. (2) Of things that are called one in virtue of their own nature some (*a*) are so called because they are continuous, e.g. a bundle is made one by a band, and pieces

of wood are made one by glue; and a line, even if it is bent, is called one if it is continuous, as each part of the body is, e.g. the leg or the arm. Of these themselves, the continuous by nature are more one than the continuous by art. A thing is called continuous which has by its own nature one movement and cannot have any other; and the movement is one when it is indivisible, and indivisible in time. Those things are continuous by their own nature which are one not merely by contact; for if you put pieces of wood touching one another, you will not say these are one piece of wood or one body or one *continuum* of any other sort. Things, then, that are continuous in any way are called one, even if they admit of being bent, and still more those which cannot be bent, e.g. the shin or the thigh is more one than the leg, because the movement of the leg need not be one. And the straight line is more one than the bent; but that which is bent and has an angle we call both one and not one, because its movement may be either simultaneous or not simultaneous; but that of the straight line is always simultaneous, and no part of it which has magnitude[1] rests while another moves, as in the bent line.

(*b*) Things are called one in another sense because the substratum does not differ in kind; it does not differ[2] in the case of things whose kind is indivisible to the sense. The substratum meant is either the nearest to, or the furthest from, the final state. For, on the one hand, wine is said to be one and water is said to be one, *qua* indivisible in kind; and, on the other hand, *all* juices, e.g. oil and wine, are said to be one, and so are all things that can be melted, because the ultimate substratum of all is the same; for all of these are water or air.

(*c*) Those things are called one whose genus is one though distinguished by opposite differentiae; and these are all called one because the genus which underlies the differentiae is one (e.g. horse, man, and dog are one, because all are animals), and in a way similar to that in which the matter is one.[3]

[1] Any *point* may remain fixed while the line rotates round it; but a point has no magnitude.

[2] 1016a 18 read ἀδιάφορον—ἀδιάφορον δέ.

[3] Cf. (*b*) above.

These are sometimes called one in this way, but sometimes it is the higher genus[1] that is said to be the same (if they are *infimae species* of their genus)—the genus above the proximate genera,[2] e.g. the isosceles and the equilateral are one and the same *figure* because both are triangles, but they are not the same triangles.[3]

(*d*) Two things are called one, when the formula which states the essence of one is indivisible from another formula which shows the essence of the other (though *in itself* every formula is divisible). Thus even that which has increased or is diminishing is one, because its formula is one, as, in the case of planes, is the formula of their form. In general those things, the thought of whose essence is indivisible, and cannot separate them either in time or in place or in formula, are most of all one, and of these especially those which are substances. For in general those things that do not admit of division are one in so far as they do not admit of it, e.g. if something *qua* man does not admit of division, it is one man; if *qua* animal, it is one animal; if *qua* magnitude, it is one magnitude.—Now most things are called one because they do or have or suffer or are related to something else that is one, but the things that are primarily called one are those whose substance is one,—and one either in continuity or in form or in formula; for we count as more than one either things that are not continuous, or those whose form is not one, or those whose formula is not one.

(*e*) While in a sense we call anything one if it is a quantity and continuous, in a sense we do not unless it is a whole, i.e. unless it has one form; e.g. if we saw the parts of a shoe put together anyhow we should not call them one all the same (unless because of their continuity); we do this only if they are put together so as to be a shoe and have already some one form. This is why the circle is of all lines most truly one, because it is whole and complete.

[1] 1016a 29 read ὁτὲ δὲ τὸ ἄνω γένος.
[2] 1016a 30 retain τὸ ἀνωτέρω τούτων.
[3] Horse, man, and dog, are one, because all are animals. But if we are to call them one *something*, we cannot call them one (kind of) animal, but must go to the higher genus and call them one (kind of) living thing.

The *essence* of 'one' is to be a beginning of number; for the first measure is the beginning, for that by which we first[1] know each class is the first measure of the class; the one, then, is the beginning of the knowable regarding each class. But the one is not the same in all classes. For here it is a quarter-tone, and there it is the vowel or the consonant; and there is another unit of weight and another of movement. But everywhere the one is indivisible either in quantity or in kind. That which is indivisible in quantity and *qua* quantity is called a unit if it is not divisible in any dimension and is without position, a point if it is not divisible in any dimension and has position, a line if it is divisible in one dimension, a plane if in two, a body if divisible in quantity in all—i.e. in three—dimensions. And, reversing the order, that which is divisible in two dimensions is a plane, that which is divisible in one a line, that which is in no way divisible in quantity is a point or a unit,—that which has not position a unit, that which has position a point.

Again, some things are one in number, others in species, others in genus, others by analogy; in number those whose matter is one, in species those whose definition is one, in genus those to which the same figure of predication applies,[2] by analogy those which are related as a third thing is to a fourth. The latter kinds of unity are always found when the former are, e.g. things that are one in number are one in species, while things that are one in species are not all one in number; but things that are one in species are all one in 1017a
genus, while things that are so in genus are not all one in species but are all one by analogy; while things that are one by analogy are not all one in genus.

Evidently 'many' will have meanings opposite to those of 'one'; some things are many because they are not continuous, others because their matter—either the proximate matter or the ultimate—is divisible in kind, others because the formulae which state their essence are more than one.

[1] 1016b 19 read ᾧ γὰρ πρώτῳ.
[2] Sc. the same category. Cf. note on A. 986a 23.

CHAPTER VII

Things are said to 'be' (1) in an accidental sense, (2) by their own nature.

(1) In an accidental sense, e.g., we say 'the just is musical', and 'the man is musical' and 'the musical is a man', just as we say 'the musical builds', because the builder happens to be musical or the musical happens to be a builder; for here 'one thing is another' means 'one is an accident of another'. So in the cases we have mentioned; for when we say 'the man is musical' and 'the musical is a man', or 'the white is musical' or 'the musical is white', the last two mean that both attributes are accidents of the same thing, which *is*; the first that the attribute is an accident of that which *is*; while 'the musical is a man' means that 'musical' is an accident of man. In this sense, too, the not-white is said to *be*, because that of which it is an accident *is*. Thus when one thing is said in an accidental sense to be another, this is either because both belong to the same thing, and this *is*, or because that to which the attribute belongs *is*, or because the subject which has as an attribute that of which it is itself predicated, itself *is*.

(2) The kinds of essential being are those that are indicated by the figures of predication[1]; for the senses of 'being' are just as many as these figures. Since some predicates indicate what the subject is, others its quality, others quantity, others relation, others activity or passivity, others its 'where', others its 'when', 'being' has a meaning answering to each of these. For there is no difference between 'the man is recovering' and 'the man recovers', nor between 'the man is walking' or 'cutting' and 'the man walks' or 'cuts'; and similarly in all other cases.

(3) 'Being' and 'is' mean that a statement is true, 'not being' that it is not true but false,—and this alike in affirmation and negation; e.g. 'Socrates *is* musical' means that this is true, or 'Socrates *is* not-white' means that this is true; but 'the diagonal of the square *is not* commensurate with the side' means that it is false to say it is.

(4) Again, 'being' and 'that which is', in these cases we

[1] i. e. the categories. Cf. note on A. 986a 23.

have mentioned, sometimes mean being potentially, and sometimes being actually. For we say both of that which sees potentially and of that which sees actually, that it is 'seeing', and both of that which can use knowledge and of that which is using it, that it knows, and both of that to which rest is already present and of that which can rest, that it rests. And similarly in the case of substances we say the Hermes is in the stone, and the half of the line is in the line, and we say of that which is not yet ripe that it is corn. *When* a thing is potential and when it is not yet potential must be explained elsewhere.[1]

CHAPTER VIII

'Substance' means (1) the simple bodies, i. e. earth and fire and water and everything of the sort, and in general bodies and the things composed of them, both animals and divine beings, and the parts of these. All these are called substance because they are not predicated of a subject but everything else is predicated of them.—(2) That which, being present in such things as are not predicated of a subject, is the cause of their being, as the soul is of the being of animals.[2]—(3) The parts which are present in such things, limiting them and marking them as individuals, and by whose destruction the whole is destroyed, as the body is by the destruction of the plane, as some say, and the plane by the destruction of the line; and in general number is thought by some to be of this nature; for if it is destroyed, they say, nothing exists, and it limits all things.—(4) The essence, the formula of which is a definition, is also called the substance of each thing.

It follows, then, that substance has two senses, (*a*) the ultimate substratum, which is no longer predicated of anything else, and (*b*) that which is a 'this' and separable[3]—and of this nature is the shape or form of each thing.

[1] Θ. 7.
[2] 1017^b 16 read τῶν ζῴων.
[3] Cf. H. 1042^a 29.

CHAPTER IX

'The same' means (1) that which is the same in an accidental sense, e. g. 'white' and 'musical' are the same because they are accidents of the same thing, and 'man' and 'musical' because the one is an accident of the other; and 'the musical' is 'man' because it is an accident of man. And the complex notion is the same as either of the simple ones and each of these is the same as it; for 'man' and 'musical' are said to be the same as 'musical man', and this is the same as they. This is why all of these statements are made not universally; for it is not true to say that *every* man is the same as 'musical'; for universal attributes belong to things in virtue of their own nature, but accidents do not belong to
1018a them in virtue of their own nature, but are predicated without qualification only of the individuals. For 'Socrates' and 'musical Socrates' are thought to be the same; but 'Socrates' is not predicable of more than one subject, and therefore we do not say 'every Socrates' as we say 'every man'.

Some things are said to be the same in this sense, others (2) are the same by their own nature, as that which is one is in some cases one by its own nature; for both the things whose matter is one either in kind or in number, and those whose essence is one, are said to be the same. Clearly, therefore, sameness is a unity of the being either of more than one thing or of one thing when it is treated as more than one, i. e. when we say a thing is the same as itself; for we treat it as two.

Things are called 'other' if either their kinds or their matters or the formulae of their essence are more than one; and in general 'other' has meanings opposite to those of 'the same'.

'Different' is applied to (1) those things which though other are the same in some respect, only not in number but either in species or in genus or by analogy; (2) those whose genus is other, and contraries, and all things that have their otherness in their essence.

Those things are called 'like' which have the same attributes in every respect, and those which have more attributes the same than different, and those whose quality is one; and

that which shares with another thing the greater number or the more important of the attributes (each of them one of two contraries) in respect of which things are capable of altering, is like that other thing.[1] The senses of 'unlike' are opposite to those of 'like'.

CHAPTER X

The term 'opposite' is applied to contradictories, and contraries, and relative terms, and privation and possession, and the extremes from which and into which generation and dissolution take place;[2] and the attributes that cannot be present at the same time in that which is receptive of both, are said to be opposed,—either themselves or their constituents. Grey and white colour do not belong at the same time to the same thing; therefore their constituents are opposed.[3]

The term 'contrary' is applied (1) to those attributes that differ in genus, which cannot belong at the same time to the same subject, (2) to the most different of the things in the same genus, (3) to the most different of the attributes in the same receptive material, (4) to the most different of the things that fall under the same faculty, (5) to the things whose difference is greatest either absolutely or in genus or in species. The other things that are called contrary are so called, some because they possess contraries of the above kind, some because they are receptive of such, some because they are productive of or susceptible to such, or are producing or suffering them, or are losses or acquisitions, or possessions or privations, of such. Since 'one' and 'being' have many senses, the other concepts which are derived from these, and therefore 'same', 'other', and 'contrary', must correspond, so that they must be different for each category.

The term 'other in species' is applied to things which 1018b
being of the same genus are not subordinate the one to the

[1] Such attributes are hot and cold, wet and dry, rough and smooth, hard and soft, white and black, sweet and bitter. The more important pairs of contraries, in Aristotle's view, are the first two.

[2] The extremes meant may be (1) being and not being, or (2) matter (potentiality) and form (actuality).

[3] We cannot say grey and white are opposed, but we say the constituents of grey (black and white) are opposed.

other, or which being in the same genus have a difference,[1] or which have a contrariety in their substance; and contraries are other than one another in species (either all contraries or those which are so called in the primary sense[2]), and so are those things whose formulae differ in the *infima species* of the genus (e. g. man and horse are indivisible in genus, but their formulae are different), or which being in the same substance have a difference.[3] 'The same in species' has the various meanings opposite to these.

CHAPTER XI

The words 'prior' and 'posterior' are applied (1) to some things (on the assumption that there is a first, i. e. a beginning, in each class) because they are nearer some beginning determined either absolutely and by nature, or by reference to something or in some place or by certain people, e. g. things are prior in place because they are nearer either to some place determined by nature, e. g. the middle or the last place, or to some chance object; and that which is further is posterior.—Other things are prior in time; some by being further from the present, i. e. in the case of past events (for the Trojan war is prior to the Persian, because it is further from the present), others by being nearer the present, i. e. in the case of future events (for the Nemean games are prior to the Pythian, if we treat the present as beginning and first point, because they are nearer the present). —Other things are prior in movement; for the things that

[1] This definition is wider than the previous one, since it includes species subordinate one to the other.

[2] Cf. 1018a 25–31 in distinction from 31–35.

[3] No satisfactory explanation of this clause has been proposed. Alexander suggests that Aristotle may mean that individuals with the same specific essence differ in individual essence; but in ordinary language (which alone Aristotle is examining in Δ) these would not be called ἕτερα εἴδει. He also suggests that the reference may be to bodies such as earth and water which are ἕτερα εἴδει without being contrary like fire and water; but these could hardly be said to be ἐν τῇ αὐτῇ οὐσίᾳ. Asclepius suggests more plausibly that the reference may be to different elements in the essence of complex substances, e. g. to heat and cold in the essence of man. Cf. νοῦς and αἴσθησις in the human soul. Aquinas thinks the reference is to attributes in the same substance.

are nearer the first mover are prior (e. g. the boy is prior to the man); and the prime mover also is a beginning absolutely.—Others are prior in power; for that which exceeds in power, i. e. the more powerful, is prior; and such is that according to whose will the other—i. e. the posterior—must follow, so that if the prior does not set it in motion the other does not move, and if it sets it in motion it does move; and here will is a beginning.—Others are prior in arrangement; these are the things that are placed at certain intervals in reference to some one definite thing according to rule, e. g. in the chorus the second man is prior to the third, and in the lyre the second-lowest string is prior to the lowest; for in the one case the leader and in the other the middle string is the beginning.

These, then, are called prior in this sense, but (2) in another sense that which is prior for knowledge is treated as absolutely prior; of these, the things that are prior in formula are different from those that are prior in perception. For in formula universals are prior, in perception individuals. And in formula also the accident is prior to the whole, e. g. 'musical' to 'musical man', for the formula cannot exist as a whole without the part; yet musicalness cannot exist unless there is *some one* who is musical.

(3) The attributes of prior things are called prior, e. g. straightness is prior to smoothness; for one is an attribute of a line as such, and the other of a surface.

Some things then are called prior and posterior in this 1019a
sense, others (4) in respect of nature and substance, i. e. those which can be without other things, while the others cannot be without *them*,—a distinction which Plato used.[1] If we consider the various senses of 'being',[2] firstly the subject is prior (so that substance is prior); secondly, according as potency or actuality is taken into account, different things are prior, for some things are prior in respect of potency, others in respect of actuality, e. g. in potency the half line is prior to the whole line and the part to the whole and the matter to the concrete substance, but in actuality these are posterior; for

[1] 1019a 4 read ἐχρήσατο. Cf. *Timaeus* 34 B, C. Or the reference may be to the Platonic Διαιρέσεις. Cf. *Divisiones Aristoteleae*, ed. Mutschmann, pp. xvii, xviii.

[2] Cf. ch. 7.

it is only when the whole is dissolved that they will exist in actuality. In a sense, therefore, all things that are called prior and posterior are so called according to this fourth sense; for some things can exist without others in respect of generation, e.g. the whole without the parts, and others in respect of dissolution, e.g. the part without the whole. And the same is true in all other cases.

CHAPTER XII

'Potency' means (1) a source of movement or change, which is in another thing than the thing moved or in the same thing *qua* other, e.g. the art of building is a potency which is not in the thing built, while the art of healing, which is a potency, might be in the man healed, but not in him *qua* healed. 'Potency' then means the source, in general, of change or movement in another thing or in the same thing *qua* other, and also the source of a thing's being moved by another thing or by itself *qua* other. For in virtue of that principle, in virtue of which the patient suffers anything, we call it 'capable' of suffering; and this we do sometimes if it suffers anything at all, sometimes not in respect of everything it suffers, but only if it suffers a change for the better.—(2) The capacity of performing this well or according to intention; for sometimes we say of those who merely can walk or speak but not well or not as they intend, that they *cannot* speak or walk. The case of passivity is similar.—(3) The states in virtue of which things are absolutely impassive or unchangeable, or not easily changed for the worse, are called potencies; for things are broken and crushed and bent and in general destroyed not by having a potency but by not having one and by lacking something, and things are impassive with respect to such processes if they are scarcely and slightly affected by them, because of a 'potency' and because they 'can' do something and are in some positive state.

As 'potency' has so many meanings, the 'potent' or 'capable' in one sense will mean that which can begin a movement (or a change in general, for even that which can bring things to rest is a 'potent' thing) in another thing or in itself *qua*

other; and in one sense that over which something else has such a potency; and in one sense that which has a potency of 1019b changing into something, whether for the worse or for the better (for even that which perishes is thought to be 'capable' of perishing, for it would not have perished if it had not been capable of it; but, as a matter of fact, it has a certain disposition and cause and principle which fits it to suffer this;—sometimes it is thought to be of this sort because it has something, sometimes because it is deprived of something; but if privation is in a sense 'having' or 'habit', everything will be capable by having something, so that things are capable both by having a positive habit and principle, and by having the privation of the positive principle, if it is possible to *have* a privation; and if privation is *not* in a sense 'habit', 'capable' is used in two distinct senses[1]); and a thing is capable in another sense because neither any other thing, nor itself *qua* other, has a potency or principle which can destroy it. Again, all these are capable either merely because the thing might chance to happen or not to happen, or because it might do so *well*. This sort of potency is found also in lifeless things, e.g. in instruments; for we say one lyre can be made to 'speak', and another cannot be made to 'speak' at all, if it has not a good tone.

Incapacity is privation of capacity—i.e. of such a principle as has been described—either in general or in the case of something that would naturally have the capacity, or even at the time when it would naturally already have it; for the senses in which we should call a boy and a man and a eunuch incapable of begetting are distinct.—Again, to either kind of capacity there is an opposite incapacity—both to that which only *can* produce movement and to that which can produce it well.

Some things, then, are called *ἀδύνατα* in virtue of this kind of incapacity, while others are so in another sense, i.e. in that in which we couple *δυνατόν* and *ἀδύνατον*.[2] The impossible

[1] 1019b 7 read *εἴη τι, ὥστε τῷ τε ἔχειν ἕξιν τινὰ καὶ ἀρχήν ἐστι δυνατὸν καὶ τῷ ἔχειν τὴν τούτου στέρησιν, εἰ ἐνδέχεται ἔχειν στέρησιν· εἰ δὲ μή, ὁμωνύμως.* So perhaps Alexander.

[2] 1019b 22 retain *οἷον*. Aristotle passes now to *δυνατόν* and *ἀδύνατον* in the sense of 'possible' and 'impossible'.

is that of which the contrary is of necessity true, e.g. that the diagonal of a square is commensurate with the side is impossible, because such a statement is a falsity such that not only is the contrary true but it is *necessary* that the diagonal should be incommensurate; that it is commensurate, then, is not only false but of necessity false. The contrary of this, the possible, is found when it is not necessary that the contrary is false, e.g. that a man should be seated is possible; for that he is not seated is not of necessity false.—The possible, then, in one sense, as has been said, means that which is not of necessity false; in one, that which is true; in one, that which is capable of being true.—A 'potency' or 'power'[1] in geometry is so called by a change of meaning.—These senses of 'capable' or 'possible' involve no reference to potency. But the senses which involve a reference to potency all refer to the one primary
1020a kind of potency; and this is a source of change in another thing or in the same thing *qua* other. For other things are called 'capable', some because something else has such a potency over them, some because it has not, some because it has it in a particular way. The same is true of the things that are incapable. Therefore the proper definition of the primary kind of potency will be 'a source of change in another thing or in the same thing *qua* other'.

CHAPTER XIII.

'Quantity' means that which is divisible into two or more constituent parts of which each is by nature a 'one' and a 'this'. A quantity is a plurality if it is numerable, a magnitude if it is measurable. 'Plurality' means that which is divisible potentially into non-continuous parts, 'magnitude' that which is divisible into continuous parts; in magnitude, that which is continuous in one dimension is length, in two breadth, in three depth. Of these, limited plurality is number, limited length is a line, breadth a surface, depth a solid.

Again, some things are called quantities in virtue of their own nature, others incidentally, e.g. the line is a quantity by its own nature, the musical is one incidentally. Of the things

[1] The reference is to squares and cubes.

that are quantities by their own nature some are so as substances, e.g. the line is a quantity (for 'a certain kind of quantity' is present[1] in the formula which states what it is), and others are modifications and states of this kind of substance, e.g. much and little, long and short, broad and narrow, deep and shallow, heavy and light, and the other terms of the sort. And also great and small, and greater and smaller, both in themselves and when taken relatively to each other, are by their own nature attributes of quantity; but these names are transferred to other things also. Of things that are quantities incidentally, some are so called in the sense in which it was said that 'musical' and 'white' were quantities, viz. because that to which they belong is a quantity, and some are quantities in the way in which movement and time are so; for these are called quantities and continuous because the things of which these are attributes are divisible. I mean not that which is moved, but the space through which it is moved; for because that is a quantity movement also is a quantity, and because this is a quantity time is so.

CHAPTER XIV

'Quality' means (1) the differentia of the essence, e.g. man is an animal of a certain quality because he is two-footed, and the horse is so because it is four-footed; and a circle is a figure of particular quality because it is without angles,—which shows that the essential differentia is a quality.—This, then, is 1020b
one meaning of quality—essential differentia, but (2) there is another sense in which it applies to the unmovable objects of mathematics; i.e. the numbers have a certain quality, e.g. the composite numbers which are not in one dimension only, but of which the plane and the solid are copies (these are those which have two or three factors); and in general that which exists in the essence of numbers besides quantity is quality; for the essence of each is what it is once, e.g. that of 6 is not what it is twice or thrice, but what it is once; for 6 is once 6.

(3) All the attributes of substances in motion (e.g. heat and cold, whiteness and blackness, heaviness and lightness, and the

[1] 1020a 19 read ποσόν τι ὑπάρχει.

others of the sort), in virtue of which, when they change, bodies are said to alter. (4) Quality in respect of virtue and vice and, in general, of evil and good.

Quality, then, seems to have practically two meanings, and one of these is the more proper. The primary quality is the essential differentia, and of this the quality in numbers is a part; for it is a differentia of essences, but either not of things in motion or not of them *qua* in motion. Secondly, there are the modifications of things in motion *qua* in motion, and the differentiae of movements. Virtue and vice fall among these modifications; for they indicate differentiae of the movement or activity, according to which the things in motion act or are acted on well or badly; for that which can be moved or act in one way is good, and that which can do so in another—the contrary—way is vicious. Good and evil indicate quality especially in living things, and among these especially in those which have purpose.

CHAPTER XV

Things are relative (1) as double to half and treble to a third, and in general that which contains something else many times to that which is contained many times in something else, and that which exceeds to that which is exceeded; (2) as that which can heat to that which can be heated, and that which can cut to that which can be cut, and in general the active to the passive; (3) as the measured to the measure and the known to knowledge and the perceived to perception.

(1) Relative terms of the first kind are numerically related either indefinitely or definitely, either to various numbers or to 1, e.g. the double is in a definite numerical relation to 1, and that which is 'many times as great' is in a numerical, but not in a definite, relation to 1, i.e. not in this or in that rela-
1021[a] tion to it; the relation of that which is $\frac{3}{2}$ of something else to that something is a definite numerical relation to a number; that which is

$$\frac{n+1}{n}$$

times something else is in an indefinite relation to that some-

thing, as that which is 'many times as great' is in an indefinite relation to 1; the relation of that which exceeds to that which is exceeded is numerically quite indefinite; for number is always commensurate, but this relation may involve a 'non-commensurate number'; for that which exceeds is, in relation to that which is exceeded, so much and something more; and this something is indefinite; for it can, indifferently, be either equal or not equal to that which is exceeded.—All these relations are numerically expressed and are determinations of number, and so in another way are the equal and the like and the same, for all refer to unity. Those things are the same whose substance is one; those are like whose quality is one; those are equal whose quantity is one; and 1 is the beginning and measure of number, so that all these relations imply number, though not in the same way.

(2) The active and the passive imply an active and a passive potency and the actualization of the potencies, e.g. that which is capable of heating is related to that which is capable of being heated, because it *can* heat it, and, again, that which heats is related to that which is heated and that which cuts to that which is cut, because they actually do these things. But *numerical* relations are not actualized except in the sense which has been elsewhere [1] stated; actualizations in the sense of movement they have not. Of relations which imply potency some [2] further imply particular periods of time, e.g. that which has made is relative to that which has been made and that which will make to that which will be made. For it is in this way that a father is called father *of his son*; for the one has acted, and the other has been acted on in a certain way.[3] Further, some relative terms imply *privation* of potency, i.e. 'incapable' and terms of this sort, e.g. 'invisible'.

Relative terms which imply number or potency, therefore, are all relative because their very essence includes in its nature a reference to something else, not because something else is

[1] Cf. Θ. 1051a 30.
[2] 1021a 22 read λέγονταί ⟨τινα⟩ πρός τι. So perhaps Alexander.
[3] i. e. there need not be any *present* relation to justify the use of the relative form of words; there is always the past relation.

referred to *it*; but (3) that which is measured or known or thought is called relative because something else is referred to it. For 'that which is thought' implies that the thought of it exists, but the thought is not relative to 'that of which it is the thought'; for we should then have said the same thing twice. Similarly sight is the sight of something, not
1021b 'of that of which it is the sight' (though of course it is true to say this); in fact it is relative to colour or to something else of the sort. But according to the other way of speaking the same thing would be said twice,—'it is the sight of that which is the object of sight.'

Things that are by their own nature called relative are called so sometimes in these senses, sometimes because the classes that include them are of this sort, e.g. medicine is a relative term because its genus, science, is thought to be a relative term. Further, there are the properties in virtue of which the things that have them are called relative, e.g. equality is relative because the equal is, and likeness because the like is. Other things are relative by accident, e.g. a man is relative because he happens to be double of something and double is a relative term; or the white is relative, if the same thing happens to be double and white.

CHAPTER XVI

'The complete' means (1) that outside which it is not possible to find even one of the parts proper to it, e.g. the complete time of each thing is that outside which it is not possible to find any time which is a part proper to it.—(2) That which in respect of excellence and goodness cannot be excelled in its kind, e.g. a doctor is complete and a flute-player is complete, when they lack nothing in respect of their proper kind of excellence. And thus we transfer the word to bad things, and speak of a complete scandal-monger and a complete thief; indeed we even call them *good*, i.e. a good thief and a good scandal-monger. And excellence is a completion; for each thing is complete and every substance is complete, when in respect of its proper kind of excellence it lacks no part of its natural magnitude.—(3) The things which have attained a good end

are called complete; for things are complete in virtue of having attained their end. Therefore, since the end is something ultimate, we transfer the word to bad things and say a thing has been completely spoilt, and completely destroyed, when it in no wise falls short of destruction and badness, but is at its last point. This is why death is by a figure of speech called the end, because both are last things. The ultimate purpose is also an end.—Things, then, that are called complete in virtue of their *own* nature are so called in all these senses, some because they lack nothing in respect of goodness and cannot be excelled and no part proper to them can be found outside, others in general because they cannot be exceeded in their several classes and no part proper to them is outside; 1022a
the *others* are so called in virtue of these first two kinds, because they either make or have something of the sort or are adapted to it or in some way or other are referred to the things that are called complete in the primary sense.

CHAPTER XVII

'Limit' means the last point of each thing, i.e. the first point beyond which it is not possible to find any part, and the first point within which every part is; it is applied to the form, whatever it may be, of a spatial magnitude or of a thing that has magnitude, and to the end of each thing (and of this nature is that towards which the movement and the action are—not that from which they are, though sometimes it is both, that from which and that to which the movement is—and the final cause), and to the substance of each thing, and the essence of each; for this is the limit of knowledge; and if of knowledge, of the thing also. Evidently, therefore, 'limit' has as many senses as 'beginning', and yet more; for the beginning is a limit, but not every limit is a beginning.

CHAPTER XVIII

'That in virtue of which' has several meanings, (1) the form or substance of each thing, e.g. that in virtue of which a man is good is the good itself,[1] (2) the proximate subject in which

[1] 1022a 15 read καθὸ ἀγαθός, αὐτὸ ἀγαθόν.

an attribute is naturally found, e.g. colour in a surface. 'That in virtue of which,' then, in the primary sense is the form, and in a secondary sense the matter of each thing and the proximate substratum of each.—In general 'that in virtue of which' will be found in the same number of senses as 'cause'; for we say 'in virtue of what has he come?' or 'for what end has he come?'; and 'in virtue of what has he inferred wrongly, or inferred at all?' or 'what is the cause of the inference, or of the wrong inference?'—Further (3) *καθό* [1] is used in reference to position, e.g. 'in which he stands' or 'in which he walks'; for all such phrases indicate place and position.

Therefore 'in virtue of itself' must have several meanings. It applies to (1) the essence of each thing, e.g. Callias is in virtue of himself Callias and the essence of Callias; (2) whatever is present in the 'what', e.g. Callias is in virtue of himself an animal. For 'animal' is present in the formula that defines him; Callias is a particular animal.—(3) Whatever attribute a thing receives in itself directly or in one of its parts, e.g. a surface is white in virtue of itself, and a man is alive in virtue of himself; for the soul, in which life directly resides, is a part of the man.—(4) That which has no cause other than itself; man has more than one cause—animal, two-footed—but man is man in virtue of himself.—(5) Whatever attributes belong to a thing alone and *qua* alone; hence also that which exists separately is 'in virtue of itself'.

CHAPTER XIX

1022b 'Disposition' means the arrangement of that which has parts, in respect either of place or of potency or of kind; for there must be a certain position, as the word 'disposition' shows.

CHAPTER XX

'Having' [2] means (1) a kind of activity of the haver and the had—something like an action or movement. When one thing makes and one is made, between them there is a making; so

[1] Aristotle here mentions the original local sense of *καθό*. No English word or phrase has quite the same ambiguity.

[2] The word *ἕξις* does duty for 'having', 'habit,' and 'permanent state'.

too between him who has a garment and the garment which he has there is a having. This sort of having, then, evidently we cannot *have*; for the process will go on to infinity, if we can have the having of what we have.—(2) 'Having' or 'habit' means a disposition according to which that which is disposed is either well or ill disposed, either in itself or with reference to something else, e.g. health is a 'habit'; for it is such a disposition.—(3) We speak of a 'habit' if there is a portion of such a disposition; therefore the excellence of the parts is a 'habit'.

CHAPTER XXI

'Affection' means (1) a quality in respect of which a thing can be altered, e.g. white and black, sweet and bitter, heaviness and lightness, and all others of the kind.—(2) The already actualized alterations.—(3) Especially, injurious alterations and movements, and, above all, painful injuries.—(4) Experiences pleasant or painful[1] when on a large scale are called affections.

CHAPTER XXII

We speak of 'privation' (1) if something has not one of the attributes which a thing might naturally have, even if this thing itself would not naturally have it, e.g. a plant is said to be 'deprived' of eyes.—(2) If, though either the thing itself or its genus would naturally have an attribute, it has it not, e.g. a blind man and a mole are in different senses 'deprived' of sight; the latter in contrast with its genus,[2] the former in contrast with his own normal nature.—(3) If, though it would naturally have the attribute, and when it would naturally have it, it has it not; for blindness is a privation, but one is not 'blind' at any and every age, but only if one has not sight at the age at which one would naturally have it. Similarly a thing suffers privation when it has not an attribute in those circumstances, or[3] in that respect and in that relation and in that sense, in

[1] 1022b 20 read τῶν ἡδέων καὶ λυπηρῶν.
[2] i. e. 'quadruped'.
[3] 1022b 30 read ἐν ᾧ ἂν ᾖ.

which it would naturally have it.—(4) The violent taking away of anything is called privation.

There are just as many kinds of privations as there are of words with negative prefixes or affixes; for a thing is called unequal because it has not equality though it would naturally have it, and invisible either because it has no colour at all or because it has a poor colour, and footless either because it has no feet at all or because it has imperfect feet. Again, a privative term may be used because the thing has little of the
1023a attribute (and this means having it in a sense imperfectly), e.g. 'kernelless'; or because it has it not easily or not well (e.g. we call a thing indivisible not only if it cannot be divided but also if it cannot be easily or well divided); or because it has not the attribute at all; for it is not the one-eyed man but he who is sightless in both eyes that is called blind. This is why not every man is good or bad, just or unjust, but there is also an intermediate state.

CHAPTER XXIII

To 'have' or 'hold' means many things. (1) To treat a thing according to one's own nature or according to one's own impulse, so that fever is said to have a man, and tyrants to have their cities, and people to have the clothes they wear.—(2) That in which a thing is present as in something receptive is said to have the thing, e.g. the bronze has the form of the statue, and the body has the disease.—(3) As that which contains holds that which is contained; for a thing is said to be held by that in which it is contained, e.g. we say that the vessel holds the liquid and the city holds men and the ship sailors; and so too that the whole holds the parts.—(4) That which hinders a thing from moving or acting according to its own impulse is said to hold it, as pillars hold the incumbent weights, and as the poets make Atlas hold the heavens, implying that otherwise they would collapse on the earth, as some of the natural philosophers also say. In this way that which holds things together is said to hold the things it holds together, since they would otherwise separate, each according to its own impulse.

'Being in something' has similar and corresponding meanings to 'holding' or 'having'.

CHAPTER XXIV

'To come *from* something' means (1) to come from something as from matter, and this in two senses, either in respect of the highest genus or in respect of the lowest species, e. g. in a sense all things that can be melted come from water, but in a sense the statue comes from bronze.—(2) As from the first moving principle, e. g. the fight comes from abusive language,[1] because this is the source of the fight.—(3) From the compound of matter and shape, as the parts come from the whole and the verse from the *Iliad* and the stones from the house; ⟨the stones are to the house as part to whole,⟩ for arrangement as a house is their end, and only that which attains an end is complete.—(4) As the form from its part, e. g. man from 'two-footed' and syllable from 'letter'; for this is a different sense from that in which the statue comes 1023b
from bronze; for the composite substance comes from the sensible matter, but the form also comes from the matter of the form.—These, then, are some of the meanings of 'coming from something', but sometimes (5) one of these senses is applicable only to part of a whole, e. g. the child comes from its father and mother and plants come from the earth, because they come from a part of those things.—(6) It means coming after a thing in time, e. g. night comes from day and storm from fine weather, because the one comes after the other. Of these things some are so described because they admit of change into one another, as in the cases now mentioned; some merely because they are successive in time, e. g. the voyage took place 'from' the equinox, because it took place after the equinox, and the Thargelia come 'from' the Dionysia, because after the Dionysia.

CHAPTER XXV

'Part' means (1) that into which a quantity can in any way be divided; for that which is taken from a quantity *qua*

[1] 1023a 30 read οἷον ἐκ τῆς λοιδορίας ἡ μάχη.

quantity is always called a part of it, e.g. two is called in a sense a part of three.—(2) It means, of the parts in the first sense, only those which measure the whole; this is why two, though in one sense it is, in another is not, a part of three.—(3) The elements into which the kind might be divided apart from the quantity, are also called parts of it; for which reason we say the species are parts of the genus.—(4) The elements into which the whole is divided, or of which it consists—'the whole' meaning either the form or that which has the form; e.g. of the bronze sphere or of the bronze cube both the bronze—i.e. the matter in which the form is—and the characteristic angle are parts.—(5) The elements in the formula which explains a thing are parts of the whole; this is why the genus is called a part of the species, though in another sense the species is part of the genus.

CHAPTER XXVI

'A whole' means (1) that from which is absent none of the parts of which it is said to be naturally a whole, and (2) that which so contains the things it contains that they form a unity; and this in two senses—either as each and all one, or as making up the unity between them. For (*a*) that which is true of a whole class and is said to hold good as a whole (which implies that it is a kind of whole) is true of a whole in the sense that it contains many things by being predicated of each, and that each and all of them, e.g. man, horse, god, are one, because all are living things. But (*b*) the continuous and limited is a whole, when there is a unity consisting of several parts present in it, especially if they are present only potentially,[1] but, failing this, even if they are present actually. Of these things themselves, those which are so by nature are wholes in a higher degree than those which are so by art, as we said[2] in the case of unity also, wholeness being in fact a sort of oneness.

1024a Again, as quantities have a beginning and a middle and an end, those to which the position does not make a difference are called totals, and those to which it does, wholes, and those

[1] i.e. if they are only distinguishable, not distinct. [2] Cf. 1016a 4.

which admit of both descriptions are both wholes and totals. These are the things whose nature remains the same after transposition, but whose form does not, e. g. wax or a coat; they are called both wholes and totals; for they have both characteristics. Water and all liquids and number are called totals, but 'the whole number' or 'the whole water' one does not speak of, except by an extension of meaning. To things, to which *qua* one the term 'total' is applied, the term 'all' is applied when they are treated as separate; 'this total number,' 'all these units.'

CHAPTER XXVII

It is not any chance quantitative thing that can be said to be 'mutilated'; it must be both divisible and a whole. For two is not 'mutilated' if one of the two ones is taken away (for the part removed by mutilation is never equal to the remainder), nor in general is any number thus mutilated; for it is also necessary that the essence remain; if a cup is mutilated, it must still be a cup; but the number is no longer the same. Further, even if things consist of unlike parts, not even these things can all be said to be mutilated, for in a sense a number has unlike parts, e. g. two and three. But in general of the things to which their position makes no difference, e. g. water or fire, none can be mutilated; to be mutilated, things must be such as in virtue of their essence have a certain position. Again, they must be continuous; for a musical scale consists of unlike parts[1] and has position, but cannot become mutilated. Besides, not even the things that are wholes are mutilated by the privation of *any* part. For the parts removed must be neither those which determine the essence nor any chance parts, irrespective of their position; e. g. a cup is not mutilated if it is bored through; but only if the handle or a projecting part is removed. And a man is mutilated not if the flesh or the spleen is removed, but if an extremity is, and that not every extremity but one which when completely removed cannot grow again. Therefore baldness is not a mutilation.

[1] 1024a 21 read ἐξ ἀνομοίων.

CHAPTER XXVIII

The term 'race' or 'genus' is used (1) if there is continuous generation of things which have the same form, e.g. 'while the race of men lasts' means 'while the generation of them goes on continuously'.—(2) It means that which first brought things into existence; for so some are called Hellenes by race and others Ionians, because the former proceed from Hellen and the latter from Ion as their first begetter. And the word is used in reference to the begetter more than to the matter, though people also get a race-name from the female, e.g. 'the descendants of Pyrrha.'[1]—(3) There is
1024b genus in the sense in which 'plane' is the genus of plane figures and 'solid' of solids; for each of the figures is in the one case a plane of such and such a kind, and in the other a solid of such and such a kind; and this is what underlies the differentiae. Again, in formulae their first constituent element, which is included in the essence, is the genus, whose differentiae the qualities are said to be.—'Genus' then is used in all these ways, (1) in reference to continuous generation of the same kind, (2) in reference to the first mover which is of the same kind as the things it moves, (3) as matter; for that to which the differentia or quality belongs is the substratum, which we call matter.

Those things are said to be 'other in genus' whose ultimate substratum is different, and which are not analysed the one into the other nor both into the same thing (e.g. form and matter are different in genus); and things which belong to different categories of being; for some of the things that are said to 'be' signify essence, others a quality, others the other categories we have before distinguished;[2] these also are not analysed either into one another or into some one thing.

CHAPTER XXIX

'The false' means (1) that which is false as a *thing*, and that (*a*) because it is not put together or cannot be put together,

[1] Aristotle thinks that the male supplies the efficient and the formal, the female the material cause of generation.
[2] 1017a 24.

e.g. 'that the diagonal of a square is commensurate with the side' or 'that you are sitting'; for one of these is false always, and the other sometimes; it is in these two senses that they are non-existent. (*b*) There are things which exist, but whose nature it is to appear either not to be such as they are or to be things that do not exist, e.g. a sketch or a dream; for these are something, but are not the things the appearance of which they produce in us. We call things false in this way, then,—either because they themselves do not exist, or because the appearance which results from them is that of something that does not exist.

(2) A false *conception* is the conception of non-existent objects, in so far as it is false. Hence every conception is false when applied to something other than that of which it is true, e.g. the conception of a circle is false when applied to a triangle. In a sense there is one conception of each thing, i.e. the conception of its essence, but in a sense there are many, since the thing itself and the thing itself modified in a certain way are somehow the same, e.g. Socrates and musical Socrates. The false conception is not the conception of anything, except in a qualified sense. Hence Antisthenes foolishly claimed that nothing could be described except by its own conception,—one predicate to one subject; from which it followed that there could be no contradiction, and almost that there could be no error. But it is possible to describe each thing not only by its own conception, but also by that of something else. This may be done altogether falsely indeed, but in some ways it may be done truly, e.g. eight may be described as a double number by the use of the conception of two.

These things, then, are called false in these senses, but (3) 1025a
a false *man* is one who is ready at and fond of such conceptions, not for any other reason but for their own sake, and one who is good at impressing such conceptions on other people, just as we say *things* are false, which produce a false appearance. This is why the proof in the *Hippias*[1] that the same man is false and true is misleading. For it assumes that he is false who can deceive (i.e. the man who knows and is

[1] *Hippias Minor* 373 C seqq.

wise); and further that he who is *willingly* bad is better. This is a false result of *induction*; for a man who limps willingly is better than one who does so unwillingly; by 'limping' Plato means 'mimicking a limp', for if the man were actually lame willingly, he would perhaps be worse in this case as in the corresponding case of moral character.

CHAPTER XXX

'Accident' means that which attaches to something and can be truly asserted, but neither of necessity nor usually, e.g. if one in digging a hole for a plant found treasure. This—the finding of treasure—happens by accident to the man who digs the hole; for neither does the one come of necessity from the other or after the other, nor, if a man plants, does he usually find treasure. And a musical man might be white; but since this does not happen of necessity nor usually, we call it an accident. Therefore since there are attributes and they attach to a subject, and some of them attach in a particular place and at a particular time, whatever attaches to a subject, but not because it is this subject, at this time or in this place, will be an accident. Therefore there is no definite cause for an accident, but a chance cause, i.e. an indefinite one. Going to Aegina was an accident,[1] if the man went not in order to get there, but because he was carried out of his way by a storm or captured by pirates. The accident has happened or exists,[2]—not in virtue of itself, however, but of something else; for the *storm* was the cause of his coming to a place for which he was not sailing, and this was Aegina.

'Accident' has also another meaning, i.e. what attaches to each thing in virtue of itself but is not in its essence, as having its angles equal to two right angles attaches to the triangle. And accidents of this sort may be eternal, but no accident of the other sort is. This is explained elsewhere.[3]

[1] 1025a 26 read *συνέβη τὸ εἰς Αἴγιναν ἐλθεῖν*.
[2] 1025a 28 read *δὴ ἧ ἔστι*.
[3] E. 2, 3, K. 8, An. Post. I. 75a 18.

BOOK VI (E)

CHAPTER I

WE are seeking the principles and the causes of the things 1025b that are, and obviously of things *qua* being. For there is a cause of health and of good condition, and the objects of mathematics have principles and elements and causes, and in general every science which is ratiocinative or at all involves reasoning deals with causes and principles, exact or indeterminate; but all these sciences mark off some particular being—some genus, and inquire into this, but not into being simply nor *qua* being, nor do they offer any discussion of the essence of the things of which they treat; but starting from the essence —some making it plain to the senses, others assuming it as a hypothesis—they then demonstrate, more or less cogently, the essential attributes of the genus with which they deal. It is obvious, therefore, from such a review of the sciences,[1] that there is no demonstration of substance or of the essence, but some other way of exhibiting it. And similarly the sciences omit the question whether the genus with which they deal exists or does not exist, because it belongs to the same line of thought to show what it is and that it is.

And since natural science, like other sciences, confines itself to one class of beings, i.e. to that sort of substance which has the principle of its movement and rest present in itself, evidently it is neither practical nor productive. For the principle of production is in the producer—it is either reason or art or some potency, while the principle of action is in the doer—viz. will, for that which is done and that which is willed are the same. Therefore, if all thought is either practical or productive or theoretical, physics must be a theoretical science, but it will theorize about such being

[1] Cf. K. 1064a 8.

as admits of being moved, and only about that kind of substance which in respect of its definition is for the most part not separable from matter. Now, we must not fail to notice the nature of the essence and of its definition, for, without this, inquiry is but idle. Of things defined, i. e. of essences, some are like 'snub', and some like 'concave'. And these differ because 'snub' is bound up with matter (for what is snub is a concave *nose*), while concavity is independent of perceptible matter. If then all natural things are analogous to the snub
1026a in their nature—e.g. nose, eye, face, flesh, bone, and, in general, animal; leaf, root, bark, and, in general, plant (for none of these can be defined without reference to movement—they always have matter), it is clear how we must seek and define the 'what' in the case of natural objects, and also why it belongs to the student of nature to study soul to some extent, i.e. so much of it as is not independent of matter.—That physics, then, is a theoretical science, is plain from these considerations. Mathematics also is theoretical; but whether its objects are immovable and separable from matter, is not at present clear; it is clear, however, that it *considers some* mathematical objects *qua* immovable and *qua* separable from matter. But if there is something which is eternal and immovable and separable, clearly the knowledge of it belongs to a theoretical science,—not, however, to physics (for physics deals with certain movable things) nor to mathematics, but to a science prior to both. For physics deals with things which are inseparable from matter[1] but not immovable, and some parts of mathematics deal with things which are immovable, but probably not separable, but embodied in matter; while the first science deals with things which are both separable and immovable. Now all causes must be eternal, but especially these; for they are the causes of so much of the divine as appears to us.[2] There must, then, be three theoretical philosophies, mathematics, physics, and what we may call theology, since it is obvious that if the divine is present anywhere, it is present in things of this sort. And the highest science must deal with the highest genus, so that the theoretical

[1] 1026a 14 read ἀχώριστα.
[2] i.e. the movements of the heavenly bodies.

sciences are superior to the other sciences, and this to the other theoretical sciences. One might indeed raise the question whether first philosophy is universal, or deals with one genus, i.e. some one kind of being; for not even the mathematical sciences are all alike in this respect,—geometry and astronomy deal with a certain particular kind of thing, while universal mathematics applies alike to all. We answer that if there is no substance other than those which are formed by nature, natural science will be the first science; but if there is an immovable substance, the science of this must be prior and must be first philosophy, and universal in this way, because it is first. And it will belong to this to consider being *qua* being—both what it is and the attributes which belong to it *qua* being.[1]

CHAPTER II

But since the unqualified term 'being' has several meanings, of which one was seen[2] to be the accidental, and another the true ('non-being' being the false), while besides these there are the figures of predication, e.g. the 'what', quality, quantity, place, time, and any similar meanings which 'being' may have; and again besides all these there is that which 'is' 1026^{b}
potentially or actually:—since 'being' has many meanings, we must first say regarding the *accidental*, that there can be no scientific treatment of it. This is confirmed by the fact that no science—practical, productive, or theoretical—troubles itself about it. For on the one hand he who produces a house does not produce all the attributes that come into being along with the house; for these are innumerable; the house that is made may be pleasant for some people, hurtful to some, and useful to others, and different—to put it shortly—from all things that are[3]; and the science of building does not aim at producing any of these attributes. And in the same way the geometer does not consider the attributes which

[1] With ch. I cf. B. 955^{b} 10–13, 997^{a} 15–25.
[2] Cf. Δ. 7.
[3] For the point of the last clause cf. ll. 12, 17, below. The question as to the identity or difference of various things was popular with the Sophists.

attach thus to figures, nor whether 'triangle' is different from 'triangle whose angles are equal to two right angles'. —And this happens naturally enough; for the accidental is practically a mere name. And therefore Plato[1] was in a sense not wrong in saying that sophistic deals with that which is not. For the arguments of the sophists deal, we may say, above all with the accidental; e.g. the question whether 'musical' and 'lettered' are different or the same, and whether 'musical Coriscus' and 'Coriscus' are the same, and whether 'everything which is, but is not eternal, has come to be', with the paradoxical conclusion that if one who was musical has come to be lettered, he must also have been lettered and have come to be musical,—and all the other arguments of this sort; the accidental is obviously akin to non-being. And this is clear also from arguments such as the following: of things which are in another sense there is generation and decay, but of things which are accidentally there is not. But still we must, as far as we can, say, regarding the accidental, what is its nature and from what cause it proceeds; for it will perhaps at the same time become clear why there is no science of it.

Since, among things which are, some are always in the same state and are of necessity (not necessity in the sense of compulsion but that which means the impossibility of being otherwise), and some are not of necessity nor always, but for the most part, this is the principle and this the cause of the existence of the accidental; for that which is neither always nor for the most part, we call accidental. For instance, if in the dog-days there is wintry and cold weather, we say this is an accident, but not if there is sultry heat, because the latter is always or for the most part so, but not the former. And it is an accident that a man is white (for this is neither always nor for the most part so), but it is not by accident that he is an animal. And that the builder produces health is an
1027a accident, because it is the nature not of the builder but of the doctor to do this,—but the builder happened to be a doctor. Again, a confectioner, aiming at giving pleasure, may make something wholesome, but not in virtue of the confectioner's

[1] Cf. *Sophistes* 237 A, 254 A.

art; and therefore we say it was an accident, and while there is a sense in which he makes it, in the full sense he does not make it.—For some accidental results sometimes tend to be produced by alien potencies,[1] but to others there corresponds no determinate art nor potency; for of things which are or come to be by accident, the cause also is accidental. Therefore, since not all things are or come to be of necessity and always, but the majority of things are *for the most part*, the accidental must exist; for instance a white man is not always nor for the most part musical, but since this sometimes happens, it must be accidental. If not, everything will be of necessity. The matter, therefore, which is capable of being otherwise than as it usually is, is the cause of the accidental. And we must take as our starting-point the question whether everything is either always or for the most part. Surely this is impossible. There is, then, besides these something which is fortuitous and accidental. But while the usual exists, can nothing be said to be always, or are there eternal things? This must be considered later,[2] but that there is no science of the accidental is obvious; for all science is either of that which is always or of that which is for the most part. For how else is one to learn or to teach another? The thing must be determined as occurring either always or for the most part, e.g. that honey-water is useful for a patient in a fever is true for the most part. But one will not be able to state when that which is contrary to the usual law happens, e.g. 'on the day of new moon';[3] for if one can say this, 'on the day of new moon' is itself the statement of a universal or a usual law; but the accidental is contrary to such laws. We have stated, then, what the accidental is and from what cause it arises, and that there is no science which deals with it.

CHAPTER III

That there are principles and causes which are generable and destructible without ever being in course of being generated or destroyed, is obvious. For otherwise all things will

[1] 1027a 5 read ἄλλαι.

[2] Cf. Λ. 7.

[3] 1027a 25 λέγειν πότε, οἷον νουμηνίᾳ.

be of necessity, since that which is being generated or destroyed must have a cause which is not accidentally its cause. Whether is *A* to be or not? It will be if *B* happens; and if not, not. And *B* will be if *C* happens. And thus if time is constantly subtracted from a limited extent of time, one
1027b will obviously come to the present. This man, then, will die by disease or violence, *if* he goes out; and he will do this if he is thirsty; and he will be thirsty if something else happens; and thus we shall come to that which is now present, or to some past event. For instance, he will go out if he is thirsty; and he will be thirsty if he is eating something pungent; and this is either the case or not; so that he will of necessity die, or of necessity not die. And similarly if one jumps over to the past, the same account will hold good; for this—I mean the past condition—is already present in something. Everything, therefore, that is to be, will be of necessity, e. g. it is necessary that he who lives shall one day die; for already some link in the series has been forged—e. g. the presence of contraries in the same body. But whether he dies by disease or by violence, is not yet determined, but depends on the happening of something else. Clearly then the process goes back to a certain starting-point, but this no longer points to something further. This then will be the starting-point for the fortuitous, and will have nothing else as cause of its coming to be. But to what sort of starting-point and what sort of cause we thus refer the fortuitous—whether to matter or to the purpose or to the motive power, must be carefully considered.[1]

[1] The doctrine of the chapter seems to be as follows. Events in general occur as the necessary result of a series of causes. E. g. death is the necessary result of the presence of contrary elements in every living body. But there are certain events which, while beginning a causal nexus, are not the result of a causal nexus. We can never say of them, 'their conditions are being fulfilled, and they are coming to be.' At one time they are not, and at another time they are. Therefore they come to be. But they never *are coming* to be. The events A. seems to be thinking of are those which he would ascribe to free will, e. g. a man's eating pungent food. Once this is done, his death *in some determinate way* is certain; till he does it, only his death is certain.

CHAPTER IV

Let us dismiss the accidental; for we have sufficiently determined its nature. But since that which *is* in the sense of being true, or *is not* in the sense of being false, depends on combination[1] and separation, and truth and falsehood together depend on the decision between the two sides of a contradiction (for the true judgement affirms where the subject and predicate really are combined, and denies where they are separated, while the false judgement predicates the contradictory of this—it is another question, how it happens that we think things together or apart; by 'together' and 'apart' I mean thinking them so that there is no succession in the thoughts but they become a unity—; for falsity and truth are not in things—it is not as if the good were true, and the bad were in itself false—but in thought; while with regard to simple concepts and essences falsity and truth do not exist even in thought):—we must consider later[2] what has to be discussed with regard to that which is or is not in this sense; but since the combination and the separation are in thought and not in the things, and that which is in this sense is a different sort of 'being' from the things that are in the full sense (for the thought attaches or removes either the 'what' or quality or quantity or one of the other categories), that which *is* accidentally and that which *is* in the sense of being true must be dismissed. For the cause of the former is indeterminate, and that of the latter is some affection of the thought, and both are related to the remaining genus of being, and do not indicate any separate class of being. Therefore let these be dismissed, and let us consider the causes and the principles of being itself, *qua* being. It was clear in our discussion of the various meanings of terms,[3] that 'being' has several meanings.

[1] 1027b 19 read παρὰ σύνθεσιν.

[2] Cf. Θ. 10.

[3] Δ. 7.

BOOK VII (Z)

CHAPTER I

THERE are several senses in which a thing may be said to 'be', as we pointed out previously in our book on the various senses of words;[1] for in one sense the 'being' meant is 'what a thing is' or the individual thing, and in another sense it means that a thing is of a certain quality or quantity or has some such predicate asserted of it. While 'being' has all these senses, obviously that which 'is' primarily is the 'what', which indicates the substance of the thing. For when we say of what quality a thing is, we say that it is good or beautiful,[2] but not that it is three cubits long or that it is a man; but when we say *what* it is, we do not say 'white' or 'hot' or 'three cubits long', but 'man' or 'God'. And all other things are said to be because they are, some of them, quantities of that which *is* in this primary sense, others qualities of it, others affections of it, and others some other determination of it. And so one might raise the question whether walking and being healthy and sitting are, each of them, existent or non-existent, and similarly in any other case of this sort; for none of them is either self-subsistent or capable of being separated from substance, but rather, if anything, it is that which walks or is seated or is healthy that is an existent thing. Now these are seen to be more real because there is something definite which underlies them; and this is the substance or individual, which is implied in such a predicate; for 'good' or 'sitting' apart from that which sits or is good has no meaning. Clearly then it is in virtue of this category that each of the others *is*. Therefore that which is primarily and *is* simply (not 'is something') must be substance.

Now there are several senses in which a thing is said to be first; but substance is first in every sense—(1) in formula,

[1] Cf. Δ. 7.

[2] 1028^a 16 read καλόν.

(2) in order of knowledge, (3) in time. For (3) of the other categories none can exist independently, but only substance. And (1) in formula also this is first; for in the formula of each term the formula of its substance must be present. And (2) we think we know each thing most fully, when we know what it is, e.g. what man is or what fire is, rather than when we know its quality, its quantity, or where it is; since 1028b
we know each of these predicates also, only when we know *what* the quantity or the quality *is*.

And indeed the question which was raised of old and is raised now and always, and is always the subject of doubt, viz. what being is, is just the question, what is substance? For it is this that some assert to be one, others more than one, and that some assert to be limited in number, others unlimited. And so we also must consider chiefly and primarily and almost exclusively what that is which *is* in this sense.

CHAPTER II

Substance is thought to belong most obviously to bodies; and so we say that both animals and plants and their parts are substances, and so are natural bodies such as fire and water and earth and everything of the sort, and all things that are parts of these or composed of these (either of parts or of the whole bodies), e.g. the heaven and its parts, stars and moon and sun. But whether these alone are substances, or there are also others, or only some of these, or some of these and some other things[1] are substances, or none of these but only some other things, must be considered. Some think the limits of body, i.e. surface, line, point, and unit, are substances, and more so than body or the solid.

Further, some do not think there is anything substantial besides sensible things, but others think there are eternal substances which are more in number and more real, e.g. Plato posited two kinds of substance—the Forms and the objects of mathematics—as well as a third kind, viz. the substance of

[1] 1028b 14 read ἢ τούτων τινὲς ἢ καὶ ἄλλαι. The possibilities are (*a*) all of these, (*b*) all of these and some others, (*c*) some of these, (*d*) some of these and some others, (*e*) some others.

sensible bodies. And Speusippus made still more kinds of substance, beginning with the One, and making principles for each kind of substance, one for numbers, another for spatial magnitudes, and then another for the soul; and in this way he multiplies the kinds of substance. And some say Forms and numbers have the same nature, and other things come after them, e. g. lines and planes, until we come to the substance of the material universe and to sensible bodies.

Regarding these matters, then, we must inquire which of the common statements are right and which are not right, and what things are substances, and whether there are or are not any besides sensible substances, and how sensible substances exist, and whether there is a separable substance (and if so why and how) or there is no substance separable from sensible substances; and we must first sketch the nature of substance.

CHAPTER III

The word 'substance' is applied, if not in more senses, still at least to four main objects; for both the essence and the universal and the genus are thought to be the substance of each thing, and fourthly the substratum. Now the substratum is that of which the others are predicated, while it is itself not predicated of anything else. And so we must first determine
1029a the nature of this; for that which underlies a thing primarily is thought to be in the truest sense its substance. And in one sense matter is said to be of the nature of substratum, in another, shape, and in a third sense, the compound of these. By the matter I mean, for instance, the bronze, by the shape the plan of its form, and by the compound of these (the concrete thing) the statue. Therefore if the form is prior to the matter and more real, the compound of both[1] will be prior also for the same reason.

We have now outlined the nature of substance, showing that it is that which is not predicated of a subject, but of which all else is predicated. But we must not merely state the matter thus; for this is not enough. The statement

[1] 1029a 6 read τὸ ἐξ ἀμφοῖν.

itself is obscure, and further, on this view, *matter* becomes substance. For if this is not substance, it is beyond our power to say what else is. When all else is taken away evidently nothing but matter remains. For of the other elements some are affections, products, and potencies of bodies, while length, breadth, and depth are quantities and not substances. For a quantity is not a substance; but the substance is rather that to which these belong primarily. But when length and breadth and depth are taken away we see nothing left except that which is bounded by these, whatever it be; so that to those who consider the question thus matter alone must seem to be substance. By matter I mean that which in itself is neither a particular thing nor of a certain quantity nor assigned to any other of the categories by which being is determined. For there is something of which each of these is predicated, so that its being[1] is different from that of each of the predicates; for the predicates other than substance are predicated of substance, while substance is predicated of matter. Therefore the ultimate substratum is of itself neither a particular thing nor of a particular quantity nor otherwise positively characterized; nor yet negatively, for negations also will belong to it only by accident.

If we adopt this point of view, then, it follows that matter is substance. But this is impossible; for both separability and individuality are thought to belong chiefly to substance. And so form and the compound of form and matter would be thought to be substance, rather than matter. The substance compounded of both, i.e. of matter and shape, may be dismissed; for it is posterior and its nature is obvious. And matter also is in a sense manifest. But we must inquire into the third kind of substance; for this is the most difficult.

It is agreed that there are some substances among sensible things, so that we must look first among these. For it is an 1029b 3
advantage to advance to that which is more intelligible. For learning proceeds for all in this way—through that which is less intelligible by nature to that which is more intelligible; and just as in conduct our work is to start from what is good for each and make what is good in itself good for each, so it

[1] 1029a 22 read ὥστε τὸ εἶναι.

is our work to start from what is more intelligible to oneself and make what is intelligible by nature intelligible to oneself. Now what is intelligible and primary for particular sets of people is often intelligible to a very small extent, and has little or nothing of reality. But yet one must start from that which is barely intelligible but intelligible to oneself, and try to understand what is intelligible in itself, passing, as has been said, by way of those very things which one understands.

CHAPTER IV

Since at the start we distinguished the various marks by which we determine substance, and one of these was thought to be the essence, we must investigate this. And first let us make some abstract linguistic remarks about it. The essence of each thing is what it is said to be *propter se*[1]. For being you is not being musical; for you are not by your very nature musical. What, then, you are by your very nature is your essence.

But not the whole of this is the essence of a thing; not that which it is *propter se* as a surface is *propter se* white, because being a surface is not *identical* with being white. But again the combination of both—'being a white surface'[2] —is not the essence of surface. Why? Because 'surface' itself is repeated. The formula, therefore, in which the term itself is not present but its meaning is expressed, this is the formula of the essence of each thing. Therefore if to be a white surface is to be a smooth surface[3], to be white and to be smooth are one and the same.[4]

But since there are compounds of substance with the other categories (for there is a substrate for each category, e. g. for quality, quantity, time, place, and motion), we must inquire whether there is a formula of the essence of each of them, i. e. whether to these compounds also there belongs an essence,

[1] It seems convenient here to translate thus the phrase translated in Δ. 18 as 'in virtue of itself'.

[2] 1029b 18 read τὸ ἐπιφανείᾳ λευκῇ εἶναι.

[3] 1029b 21 read τὸ ἐπιφανείᾳ εἶναι λείᾳ. Cf. *De Sensu* 442b 11 (on Democritus).

[4] i.e. this identification does not give the essence of 'surface' (for 'surface' is repeated) but it gives the essence of 'white', since this is not repeated but replaced by an equivalent.

e. g. to white man the essence of white man. Let the compound be denoted by '*X*'.[1] What is the essence of *X*? But, it may be said, this also is not a *propter se* expression. We reply that there are just two ways in which a predicate may fail to be true of a subject *propter se*, and one of these results from the addition, and the other from the omission, of a determinant. *One* kind of predicate is not *propter se* because the term that is being defined is combined with another determinant, e. g. if in defining the essence of white one were to state the formula of white *man*; *another* because in the subject another determinant is combined with that which is expressed in the formula, e. g. if *X* meant white man, and one were to define *X* as white; white man is white indeed, but its essence 1030a
is not to be white.[2] But is being-*X* an essence at all? Probably not.[3] For the essence is an individual type; but when an attribute is asserted of an alien subject, the complex is not an individual type, e. g. white man is not an individual type, since individuality belongs only to substances.[4] Therefore there is an essence only of those things whose formula is a definition. But we have a definition not where we have a word and a formula identical in meaning (for in that case all formulae or sets of words would be definitions; for there will be some name for any set of words whatever, so that even the *Iliad* would be a definition[5]), but where there is a formula of something primary; and primary things are those which do not imply the predication of one element in them of another, alien element. Nothing, then, which is not a species of a genus will have an *essence*—only species will have it, for in these the subject is not thought to participate in the attribute and to have it as an affection,[6] nor to have it by accident; but for everything else as well, if it has a name, there will be a *formula of its meaning*—viz. that this attribute belongs to this subject;

[1] '*X*' Aristotle expresses by arbitrarily taking the word 'cloak'.

[2] 1030a 1 read οὐ μέντοι ⟨τὸ⟩ τί ἦν εἶναι λευκῷ εἶναι.

[3] 1030a 3 read ὅλως; ἢ οὔ.

[4] The point is that λευκόν is one thing, ἄνθρωπος another, while ζῷον and δίπουν are not distinct things but δίπουν is only a form of ζῷον. Thus ἄνθρωπος λευκός is not an individual type and cannot be defined, while ζῷον δίπουν is an individual type and can be defined.

[5] Sc. of the word 'Iliad'.

[6] Cf. 1037b 14-21 for the interpretation of this.

or instead of a simple formula we shall be able to give a more accurate one; but there will be no definition nor essence.

But after all, 'definition,' like 'what a thing is,' has several meanings; 'what a thing is' in one sense means substance and the individual, in another one or other of the predicands, quantity, quality, and the like. For as 'is' is predicable of all things, not however in the same sense, but of one sort of thing primarily and of others in a secondary way, so too the 'what' belongs in the full sense to substance, but in a limited sense to the other categories. For even of a quality we might ask what it is, so that a quality also is a 'what',—not in the full sense, however, but just as, in the case of that which is not, some say,[1] emphasizing the linguistic form, that that which is not *is*—not *is* simply, but *is* non-existent.

Now we must inquire how we should express ourselves on each point, but still more how the facts actually stand. And so now also since it is evident what language we use, essence will belong, just as the 'what' does, primarily and in the simple sense to substance, and in a secondary way to the other categories also,—not essence in the full sense, but the essence of a quality or of a quantity. For it must be either by an equivocation that we say these *are*, or by making qualifications and abstractions (in the way in which that which is not known may be said to be known [2]),—the truth being that we use the word neither ambiguously nor in the same sense, but just as we apply the word 'medical' when there is a *reference* to one
1030b and the same thing, not *meaning* one and the same thing, nor yet speaking ambiguously; for a patient and an operation and an instrument are called medical neither by an ambiguity nor with a single meaning, but with reference to a common end. But it does not matter in which of the two ways one likes to describe the facts; this is evident, that definition and essence in the primary and simple sense belong to substances. Still they belong to other things as well. For if we suppose this it does not follow [3] that there is a definition of every word which means the same as any formula; it must mean the same

[1] Cf. Pl. *Soph.* 237.
[2] i.e. it is known to be unknown.
[3] 1030b 6 read καὶ τῶν ἄλλων ὅμως. οὐ γὰρ ἀνάγκη.

as a particular kind of formula; and this condition is satisfied if it is a formula of something which is one, not by continuity like the *Iliad* or the things that are one by being bound together, but in one of the main senses of 'one', which answer to the senses of 'is'; now 'that which is' in one sense denotes an individual, in another a quantity, in another a quality. And so there can be a formula or definition of white man, but not in the sense in which there is a definition either of white or of a substance.

CHAPTER V

It is a difficult question, if one denies that a formula with an added determinant[1] is a definition, whether any of the terms that are not simple but coupled will be definable. For we *must* explain them by adding a determinant. E.g. there is the nose, and concavity, and snubness, which is compounded out of the two by the presence of the one in the other, and it is not by accident that the nose has the attribute either of concavity or of snubness, but in virtue of its nature; nor do they attach to it as whiteness does to Callias, or to man (because Callias, who happens to be a man, is white), but rather as 'male' attaches to animal and 'equal' to quantity, and as all so-called 'attributes *propter se*' attach to their subjects.[2] And such attributes are those in which is involved either the *formula* or the *name* of the subject of the particular attribute, and which cannot be explained without this; e.g. white can be explained apart from man, but not female apart from animal. Therefore there is either no essence and definition of any of these things, or if there is, it is in another sense, as we have said.[3]

But there is also a second difficulty about them. For if snub nose and concave nose are the same thing, snub and concave will be the same thing; but if snub and concave are not the same (because it is impossible to speak of snubness apart from the thing of which it is an attribute *propter se*,

[1] Cf. 1029^b 30.
[2] In the sense of καθ' αὑτό explained in *An. Post.* i. 73^a $37–^b$ 5.
[3] 1030^b 6.

for snubness is concavity-*in-the-nose*), either it is impossible properly to say 'snub nose' or the same thing will have been said twice, concave-nose nose; for snub nose will be concave-nose nose. And so it is absurd that such things should have an essence; if they have, there will be an infinite regress; for in snub-nose nose yet another 'nose' will be involved.

1031a Clearly then only substance is definable. For if the other categories also are definable, it must be by addition of a determinant, e.g. the qualitative is defined thus, and so is the odd, for it cannot be defined apart from number; nor can female be defined apart from animal. (When I say 'by addition' I mean the expressions in which we have to say the same thing twice, as in these instances.) And if this is true, coupled terms also, like 'odd number', will not be definable (but this escapes our notice because our formulae are not accurate). But if these also are definable, either it is in some other way or, as we said, definition and essence must be said to have more than one sense. Therefore in one sense nothing will have a definition and nothing will have an essence, except substances, but in another sense other things will have them. Clearly, then, definition is the formula of the essence, and essence must belong to substances either alone or chiefly and primarily and in the unqualified sense.

CHAPTER VI

We must inquire whether each thing and its essence are the same or different. This is of some use for the inquiry concerning substance; for each thing is thought to be not different from its substance, and the essence is said to be the substance of each thing.

Now in the case of things with accidental attributes the two would be generally thought to be different, e.g. white man would be thought to be different from the essence of white man. For if they are the same, the essence of man and that of white man are also the same; for a man and a white man are the same, as people say, so that the essence of white man and that of man would be also the same. But

probably it is not necessary that a *subject + an accident* should be the same as its essence. For the extreme terms are not in the same way identified with the middle term.—Perhaps *this* might be thought to follow, that the extreme terms, the accidents, should turn out to be the same, e.g. the essence of white and that of musical; but this is not actually thought to be the case.[1]

But in the case of so-called self-subsistent things, is a thing necessarily the same as its essence? E.g. if there are some substances which have no other substances nor entities prior to them—substances such as some assert the Ideas to be?—If the essence of good is to be different from the Idea of good, and the essence of animal from the Idea of animal, and the essence of being from the Idea of being, there will, firstly, be 1031b
other substances and entities and Ideas besides those which are asserted, and; secondly, these others will be prior substances if the essence is substance. And if the posterior substances are severed from the prior, (1) there will be no knowledge of the former (the things-themselves or Ideas), and (2) the latter (the essences) will have no being. (By 'severed' I mean, if the Idea of good has not the essence of good, and the latter has not the property of being good.) For (1) there is knowledge of each thing only when we know its essence. And (2) the case is the

[1] The argument used in ll. 21–4 is:—
Essence of white man = white man.
White man = man.
Man = essence of man.
∴ Essence of white man = essence of man.

This is absurd, and Aristotle infers that essence of white man does not = white man.

He next hints that the belief that it = white man arises from the argument:—
Man = essence of man.
Man = white man.
∴ By substitution, white man = essence of white man.

But while man = essence of man καθ' αὑτό, man = white man κατὰ συμβεβηκός (οὐ γὰρ ὡσαύτως τὰ ἄκρα γίγνεται ταὐτά). Nor is the argument any better if both the identities used are κατὰ συμβεβηκός:—
Essence of white = white.
White = white man.
White man = man (κατὰ συμβεβηκός).
Man = musical man (κατὰ συμβεβηκός).
Musical man = musical.
Musical = essence of musical.
∴ Essence of white = essence of musical.

same for other things as for the good; so that if the essence of good is not good, neither is the essence of reality real, nor the essence of unity one. And all essences alike exist or none of them does; so that if the essence of reality is not real, neither is any of the others. Again, that which has not the property of being good is not good.[1] The good, then, must be one with the essence of good, and the beautiful with the essence of beauty, and so with all things which do not depend on something else but are self-subsistent and primary. For it is enough if they are this, even if there are no Forms; and perhaps all the more if there are Forms.—At the same time it is clear that if there are Ideas such as some people say there are, the substratum of them will not be substance; for these must be substances, and not predicable of a substratum; for if they were they would exist only by being participated in.[2]—Each thing then and its essence are one and the same in no merely accidental way, as is evident both from the preceding arguments and because to *know* each thing, at least, is to know its essence, so that even by the exhibition of instances it becomes clear that both must be one.

(But of an accidental term, e.g. 'the musical' or 'the white', since it has two meanings, it is not true to say that it itself is identical with its essence; for both that to which the accidental quality belongs, and the accidental quality, are white, so that in a sense the accident and its essence are the same, and in a sense they are not; for the essence of white is not the same as the man or the white man, but it is the same as the attribute white.)

The absurdity of the separation would appear also if one were to assign a name to each of the essences; for there would be another essence besides the original one, e.g. to the essence of horse there will belong a second essence.[3] Yet why should not some things be their essences from the start, since essence is substance? But not only are a thing and its

[1] Sc. and the essence of good has not (on this theory) the property of being good, and ∴ is not good.

[2] i. e. as immanent in particulars.

[3] Sc. and so *ad infinitum*. As an infinite process is absurd, why take the first step that commits you to it—why say that the essence of horse is separate from the horse?

essence one, but the formula of them is also the same, as is clear even from what has been said; for it is not by accident that 1032a
the essence of one, and the one, are one. Further, if they were different, the process would go on to infinity; for we should have (1) the essence of one, and (2) the one, so that in their case also the same infinite regress would be found. Clearly, then, each primary and self-subsistent thing is one and the same as its essence.

Now the sophistical objections to this position, and the question whether Socrates and to be Socrates are the same thing, are obviously answered in the same way; for there is no difference either in the standpoint from which the question[1] would be asked, or in that from which one could answer it successfully. We have explained, then, in what sense each thing is the same as its essence and in what sense it is not.

CHAPTER VII

Of things that come to be some come to be by nature, some by art, some spontaneously. Now everything that comes to be comes to be by the agency of something and from something and comes to be something. And the something which I say it comes to be may be found in any category; it may come to be either a 'this' or of some size or of some quality or somewhere.

Now natural comings to be are the comings to be of those things which come to be by nature; and that out of which they come to be is what we call matter; and that by which they come to be is something which exists naturally; and the something which they come to be is a man or a plant or one of the things of this kind, which we say are substances if anything is. All things produced either by nature or by art have matter; for each of them is capable both of being and of not being, and this capacity is the matter in each.[2] And, in general, both that from which they are produced is nature, and the type according to which they are produced is nature (for that which is produced, e.g. a plant or an animal,

[1] 1032a 9 read ἐρωτήσειεν.
[2] 1032a 22 read ἐστὶν ἐν ἑκάστῳ.

has a nature), and so is that by which they are produced—the so-called 'formal' nature, which is specifically the same as the nature of the thing produced (though it is in another individual); for man begets man.

Thus, then, are natural products produced; all other productions are called 'makings'. And all makings proceed either from art or from a potency or from thought.[1] Some of them happen also spontaneously or by luck[2] just as natural products sometimes do; for there also the same things sometimes are produced without seed as well as from seed. Concerning these cases, then, we must inquire later,[3] but from art proceed
1032b the things of which the form is in the soul of the artist. (By form I mean the essence of each thing and its primary substance.) I say 'form' and not 'form or privation', for even contraries have in a sense the same form; for the substance of a privation is the opposite substance, e. g. health is the substance of disease; for it is by its absence that disease exists;[4] and health is the formula and the knowledge[5] in the soul. The healthy subject, then, is produced as the result of the following train of thought; since *this* is health, if the subject is to be healthy *this* must first be present, e. g. a uniform state of body, and if this is to be present, there must be heat; and the physician goes on thinking thus until he reduces the matter to a final step which he himself can take. Then the process from this point onward, i. e. the process towards health, is called a 'making'. Therefore it follows that in a sense health comes from health and house from house, that with matter from that without matter; ⟨'from health' and 'from house',⟩ for the medical art and the building art are the form of health and of the house; and ⟨'from that without matter', for⟩ I call the essence substance without matter. Of productions and movements one part is called thinking and the other making,—that which proceeds from the starting-point and the form is thinking, and that which proceeds from the final step of the thinking is making. And each of the inter-

[1] Cf. E. 1025b 22.
[2] For the theory of these cf. *Phys.* ii. 5, 6.
[3] Cf. 1032b 23–30.
[4] 1032b 5 omit δηλοῦται.
[5] 1032b 5 read καὶ ἡ ἐπιστήμη.

mediate steps is taken in the same way. I mean, for instance, if the subject is to be healthy his bodily state must be made uniform. What then does being made uniform imply? This or that. And this depends on his being made warm. What does this imply? Something else. And this something is present potentially; and what is present potentially is already in the physician's power.

The active principle then and the starting-point for the process of becoming healthy is, if it happens by art, the form in the soul, and if spontaneously, it is that, whatever it is, which is the starting-point of his making[1] for the man who makes by art, as in healing the starting-point is perhaps the production of warmth, and this the physician produces by rubbing. Warmth in the body, then, is either a part of health or is followed (either directly or through several intermediate steps) by something which is a part of health; and this, viz. that which produces the part, is the last step, and is itself thus a part[2] of health, and so are, e.g., the stones a part of the house, and so in all other cases.

Therefore, as we say, it is impossible that anything should be produced if there were nothing before. Obviously then some part of the result will pre-exist of necessity; for the matter is a part; for this is present in the process and it is this that becomes something. But are some also of the 1033a
elements in the *formula* matter? At least we describe in both ways[3] what bronze circles are; we describe both the matter by saying it is bronze, and the form by saying that it is such and such a figure; and figure is the proximate genus in which it is placed. The bronze circle, then, has its matter *in its formula*.[4]

And as for that out of which as matter they are produced, some things are said, when they have been produced, to be

[1] Sc. not of his thought, cf. ll. 15–17.

[2] 1032b 29 read *καὐτὸ οὕτως μέρος*. So perhaps Alexander. From the proportion established, warmth : health :: stones : house, and from the next paragraph, it would appear that warmth is treated as the matter which when specialized in a particular way becomes health. Yet Aristotle began (l. 24) by treating it as the *efficient* cause of health, and he gives no warning of the transition, nor is matter elsewhere identified with efficient cause.

[3] 1033a 1 read *ἀλλ' ἆρα . . . λόγῳ; ἀμφοτέρως γε λέγομεν*.

[4] i.e. the genus acts as matter, the differentia as form.

not it but of it, e.g. the statue is not stone but of stone. But though what becomes healthy is a man, 'a man' is not what the healthy product is said to come from. The reason is that though a thing comes both from its privation and from its substratum, which we call its matter (e.g. what becomes healthy is both a man and an invalid), it is said to come rather from its privation (e.g. it is from an invalid rather than from a man that a healthy subject is produced). And so the healthy subject is not said to *be* an invalid, but to be a man, and a healthy man. But as for the things whose privation is obscure and nameless, e.g. in bronze the privation of a particular shape or in bricks and timber the privation of arrangement as a house, the thing is thought to be produced *from* these materials, as in the former case the healthy man is produced *from* an invalid. And so, as there also a thing is not said to be that from which it comes, here the statue is not said to be wood but is said by a verbal change to be not wood but wooden, not bronze but of bronze, not stone but of stone, and the house is said to be not bricks but of bricks (though we should not say without qualification, if we looked at the matter carefully, even that a statue is produced from wood or a house from bricks, because its coming to be implies change in that from which it comes, and not permanence). For this reason, then, we use this way of speaking.

CHAPTER VIII

Since anything which is produced is produced by something (and this I call the starting-point of the production), and from something (and let this be taken to be not the privation but the matter; for the meanings we attach to these have already[1] been distinguished), and since something is produced (and this is either a sphere or a circle or whatever else it may chance to be), just as we do not make the substratum—the bronze, so we do not make the sphere, except incidentally, because the bronze sphere is a sphere and we make the former. For to make a 'this' is to make a 'this' out of the general substratum. I mean that to make the bronze round is

[1] Cf. 1033ᵃ 8.

not to make the round or the sphere, but something else, i. e. to produce this form in something else as a medium. For if we make the form, we must make it out of something else; for this was assumed.[1] E. g. we make a bronze sphere; and 1033b
that in the sense that out of this, which is bronze, we make this other, which is a sphere. If, then, we make the sphere itself, clearly we must make it in the same way, and the processes of making will regress to infinity. Obviously then the form also,[2] or whatever we ought to call the shape of the sensible thing, is not produced, nor does production relate to it,—i. e. the essence is not produced; for this is that which is made to be in something else by art or by nature or by some potency. But that there is a *bronze sphere*, this we make. For we make it out of bronze and the sphere; we bring the form into this particular matter, and the result is a bronze sphere. But if the essence of sphere[3] in general is produced, something must be produced out of something. For the product will always have to be divisible, and one part must be this and another that, I mean the one must be matter and the other form. If then a sphere is 'the figure whose circumference is at all points equidistant from the centre', part of this will be the medium in which the thing made[4] will be, and part will be in that medium, and the whole will be the thing produced, which corresponds to the bronze sphere.[5] It is obvious then from what has been said that the thing, in the sense of form or substance, is not produced, but the concrete thing which gets its name from this is produced, and that in everything which comes to be matter is present, and one part of the thing is matter and the other form.

Is there then a sphere apart from the individual spheres or a house apart from the bricks? Rather we may say that no individual would ever have been coming to be, if this had been so. The 'form' however means the 'such', and is not a 'this'—a definite thing; but the artist makes, or the father

[1] Or, 'for this other something was the underlying matter.'
[2] Sc. as well as the substratum.
[3] 1033b.11 read τοῦ δὲ σφαίρᾳ εἶναι.
[4] 1033b 15 read ἔσται ὃ ποιεῖ.
[5] i. e. 'sphere' must be a whole analysable into matter and form as 'bronze sphere' is.

generates, a 'such' out of a 'this'; and when it has been generated, it is a 'this such'.[1] And the whole 'this', Callias or Socrates, is analogous to 'this bronze sphere', but man and animal to 'bronze sphere' in general. Obviously then the cause which consists of the Forms (taken in the sense in which some maintain the existence of the Forms, i. e. if they are something apart from the individuals) is useless with regard both to comings-to-be and to substances; and the Forms need not, for this reason at least, be self-subsistent substances. In some cases it is even obvious that the producer is of the same kind as the produced (not, however, the same nor one in number, but in form), e. g. in the case of natural products (for man produces man), unless something happens contrary to nature, e. g. the production of a mule by a horse. And even these cases are similar; for that which would be found to be common to horse and ass, the genus next above them, has not received a name, but it would doubtless be both, as the mule
1034a is both. Obviously, therefore, it is quite unnecessary to set up a Form as a pattern (for we should have looked for Forms in these cases if in any; for these are substances if anything is so); the begetter is adequate to the making of the product and to the causing of the form in the matter. And when we have the whole, such and such a form in this flesh and in these bones, this is Callias or Socrates; and they are different in virtue of their matter (for that is different), but the same in form; for their form is indivisible.

CHAPTER IX

The question might be raised, why some things are produced spontaneously as well as by art, e. g. health, while others are not, e. g. a house. The reason is that in some cases the matter which determines the production in the making and producing of any work of art, and in which a part of the product is present, is such as to be set in motion by itself and in some cases is not of this nature, and of the former kind some can move itself in the particular way required,

[1] i.e. the artist, or the father, turns a mere piece of matter into a qualified piece of matter.

while other matter is incapable of this; for many things can be set in motion by themselves but not in some particular way, e. g. that of dancing. The things then whose matter is of this sort, e. g. stones, cannot be moved in the particular way required,[1] except by something else, but in another way they can move themselves; and so it is with fire. Therefore some things cannot exist apart from some one who has the art of making them, while others can exist without such a person; for motion can be started by these things which have not the art but can move of themselves, i. e. either by *other* things which have not the art or by a part of the product itself.

And it is clear also from what has been said that in a sense everything is produced from (1) another individual which shares its name (natural products are so produced), or (2) a part of itself which shares its name (e. g. the house produced by reason is produced from a house; for the art of building is the form of the house), or (3) something which contains a part of it,[2]—if we exclude things produced by accident. For what directly and of itself causes the production is a part of the product. The heat in the movement[3] causes heat in the body, and this is either health, or a part of health, or is followed by a part of health or by health itself. And so it is said to cause health, because health is caused by that to which heat attaches as a consequence.

Therefore substance[4] is the starting-point of all production, as of syllogism. It is from the 'what' that syllogisms start; and from it also we now find processes of production to start.[5] And things which are formed by nature are in the same case as these products of art. For the seed produces them as the artist produces the works of art; for it has the form potentially, and that from which the seed comes has *in a sense* the same 1034b
name as the offspring; only in a sense, for we must not expect *all* cases to have exactly the same name, as in the production of 'human being' from 'human being' (for a 'woman' also can be produced by a 'man'—and so it is not from a mule

[1] Sc. for building.
[2] 1034a 23 read ἢ ἐκ μέρους ὁμωνύμου (οἷον ἡ οἰκία ἐξ οἰκίας ἡ ὑπὸ νοῦ· ἡ γὰρ τέχνη τὸ εἶδος), ἢ ἐκ ⟨τοῦ⟩ ἔχοντός τι μέρος.
[3] Sc. of the rubber's hand.
[4] i. e. essence.
[5] Cf. τὸ εἶδος, l. 24.

that a mule is produced[1]); we must expect this only if the offspring is not an imperfect form. The natural things which (like some artificial objects) can be produced spontaneously are those whose matter can be moved even by itself in the way in which the seed usually moves it; but those things which have not such matter cannot be produced except by parents.

But not only regarding substance does our argument prove that its form does not come to be, but the argument applies to all the primary classes alike, i. e. quantity, quality, and the other categories. For as the bronze sphere comes to be, but not the sphere nor the bronze, and so too in the case of bronze itself, if it comes to be, it is its concrete unity that comes to be (for the matter and the form must always exist before), so is it as regards both 'what' and quality and quantity and the other categories likewise; for the quality does not come to be, but the wood of that quality, and the quantity does not come to be, but the wood or the animal of that size. But we may learn from these instances a peculiarity of substance, that there must exist beforehand another actual substance which produces it, e.g. an animal if an animal is produced; but it is not necessary that a quality or quantity should pre-exist otherwise than potentially.

CHAPTER X

Since a definition is a formula, and every formula has parts, and as the formula is to the thing, so is the part of the formula to the part of the thing, we are already faced by the question whether the formula of the parts must be present in the formula of the whole or not. For in some cases the formulae of the parts are seen to be present, and in some not. The formula of the circle does not include that of the segments, but that of the syllable includes that of the letters; yet the circle is divided into segments as the syllable is into letters.—And further if the parts are prior to the whole, and the acute angle is a part of the right angle and the finger a part of the animal, the acute angle will be prior to the right

[1] Cf. 1033b 33.

angle and the finger to the man. But the latter are thought to be prior; for in formula the parts are explained by reference to them, and in virtue also of their power of existing apart from the parts the wholes are prior.

Perhaps we should rather say that 'part' is used in several senses. One of these is 'that which measures another thing in respect of quantity'. But let this sense be set aside; let us inquire about the parts of which *substance* consists. If then 1035a
matter is one thing, form another, the compound of these a third, and both the matter and the form and the compound are substance, even the matter is in a sense called part of a thing, while in a sense *it* is not, but only the elements of which the formula of the form consists. E.g. flesh (for this is the matter in which it is produced) is not a part of concavity, but of snubness it is a part; and the bronze is a part of the concrete statue, but not of the statue as form. (For each thing must be referred to by naming its form, and as having form, but never by naming its material aspect as such.) And so the formula of the circle does not include that of the segments, but the formula of the syllable includes that of the letters; for the letters are parts of the formula of the form, and not matter, but the segments are parts, in the sense of matter, on which the form supervenes; yet they are nearer the form than the bronze is when roundness is produced in bronze. But in a sense not even every kind of letter will be present in the formula of the syllable, e.g. particular waxen letters or the letters as sounds in the air; for these also are part of the syllable only in the sense that they are its perceptible matter. For even if the line when divided passes away into its halves, or the man into bones and muscles and flesh, it does not follow that they are composed of these as parts of their essence, but rather as matter; and these are parts of the concrete thing, but not of the form, i.e. of that to which the formula refers; and therefore also in the formulae of some things the formula of such parts will be present,[1] but in others it must not be present, where the formula does not refer to the concrete object. For it is for this reason that some things have as their constituent principles parts into which they pass away, while some have not.

[1] 1035a 22 read καὶ ἐν τοῖς λόγοις τῶν μὲν ἐνέσται.

Those things in which the form and the matter are taken together, e.g. the snub, or the bronze circle, pass away into these material parts, and the matter is a part of them; but those things which do not involve matter but are without matter, and whose formulae are formulae of the form only, do not pass away,—either not at all or at any rate not in this way. Therefore these materials are principles and parts of the concrete things, while of the form they are neither parts nor principles. And therefore the clay statue is resolved into clay and the ball[1] into bronze and Callias into flesh and bones, and again the circle into its segments; for there is a sense of 'circle'[2] in which it involves matter. For 'circle' is used ambiguously, meaning both the circle in general and
1035b the individual circle, because there is no name proper to the individuals.

The truth has really now been stated, but still let us state it yet more clearly, taking up the question again. The parts of the formula, into which the formula is divided, are prior to it, either all or some of them. The formula of the right angle, however, does not include the formula of the acute, but the formula of the acute includes that of the right angle; for he who defines the acute uses the right angle; for the acute is 'less than a right angle'. The circle and the semicircle also are in a like relation; for the semicircle is defined by the circle; and so is the finger by the whole body, for a finger is 'such and such a part of a man'. Therefore the parts which are of the nature of matter and into which as its matter a thing is divided, are posterior; but those which are parts of the formula, and of the substance according to its formula, are prior, either all or some of them. And since the soul of animals (for this is the substance of living beings) is their substance according to the formula, i.e. the form and the essence of a body of a certain kind (at least we shall define each part, if we define it well, not without reference to its function, and this cannot belong to it without perception[3]), therefore the parts of soul are prior, either all or some of them, to the concrete animal, and similarly in each case of

[1] 1035a 32 read καὶ ἡ σφαῖρα. [2] 1035a 34 read τις ὅς.
[3] And therefore not without soul.

a concrete whole; and the body and its parts are posterior to this its essential substance, and it is not the substance but the concrete thing that is divided into these parts as its matter. To the concrete thing these are in a sense prior, but in a sense they are not. For they cannot even exist if severed from the whole; for it is not a finger in *any* state that is the finger of a living thing, but the dead finger is a finger only in name. Some parts are neither prior nor posterior to the whole, i. e. those which are most important and in which the formula, i. e. the essential substance, is immediately present, e. g. perhaps the heart or the brain; for it does not matter which of the two has this quality. But man and horse and terms which are thus applied to individuals, but universally, are not substance but something composed of this particular formula and this particular matter treated as universal; but when we come to the individual, Socrates is composed of ultimate individual matter; and similarly in all other cases.

'A part' may be a part either of the form (i. e. the essence), or of the compound of the form and the matter, or of the matter itself. But only the parts of the form are parts of the formula, and the formula is of the universal; for 'being a circle' is the 1036a
same as the circle, and 'being a soul' is the same as the soul. But when we come to the concrete thing, e. g. *this* circle, i. e. one of the individual circles, whether sensible or intelligible (I mean by intelligible circles the mathematical, and by sensible circles those of bronze and of wood), of these there is no definition, but they are known by the aid of intuitive reason or sensation; and when they go out of our actual consciousness it is not clear whether at a given time they exist or not; but they are always stated and cognized by means of the universal formula. But matter is unknowable in itself. And some matter is sensible and some intelligible, sensible matter being for instance bronze and wood and all matter that is changeable, and intelligible matter being that which is present in sensible things not *qua* sensible, i. e. in the objects of mathematics. We have stated, then, how whole and part, and prior and posterior, are related.

When any one asks whether the right angle and the circle and the animal are prior to that into which they are

divided and of which they consist, i. e. the parts, we must meet the inquiry by saying that the question cannot be answered simply. For if the soul is the animal or[1] the living thing,[2] or the soul of each individual is the individual itself, and 'being a circle' is the circle, and 'being a right angle' and the essence of the right angle is the right angle, then the whole in one sense must be called posterior to the part in one sense, i.e. to the parts included in the formula and to the parts of the individual right angle (for both the material right angle which is made of bronze, and that which is formed by individual lines, are posterior to their parts); while the immaterial right angle is posterior to the parts included in the formula, but prior to those included in the particular instance. But the question must not be answered simply. If, however, the soul is something different and is not identical with the animal, even so some parts must be called prior and others must not, as has been said.

CHAPTER XI

The question is naturally raised, what sort of parts belong to the form and what sort not to the form, but to the concrete thing. Yet if this is not plain it is not possible to define anything; for definition is of the universal and of the form. If then it is not evident which of the parts are of the nature of matter and which are not, neither will the formula of the thing be evident. In the case of things which are found to occur in specifically different materials, as a circle may exist in bronze or stone or wood, it seems plain that these, the bronze or the stone, are no part of the essence of the circle, since it is found apart from them. Of things which are *not* seen to exist apart, there is no reason why the same may not
1036b be true, e.g. even if all circles that had ever been seen were of bronze (for none the less the bronze would be no part of the form); but it is hard to effect this severance in thought. E.g. the form of man is always found in flesh and bones and parts of this kind; are these then also parts of the form and the formula? No, they are matter; but because man is

[1] Sc. to put it more widely so as to include the vegetable world.
[2] 1036a 17 read ζῷον ἢ ἔμψυχον.

not found also in other matters we are unable to effect the severance.

Since this is thought to be possible, but it is not clear *when* it is the case, some are in doubt even in the case of the circle and the triangle, thinking that it is not right to define these by lines and by continuous space, but that all these are to the circle or the triangle as flesh or bones are to man, and bronze or stone to the statue; and they reduce all things to numbers, and they say the formula of 'line' is that of 'two'. And of those who assert the Ideas some make 'two' the line itself, and others make it the form of the line; for in some cases they say the Form and that of which it is the Form are the same, e.g. 'two' and the Form of two; but in the case of 'line' they say this is no longer so.

It follows then that there is one Form for many things whose Form is evidently different (a conclusion which confronted the Pythagoreans also); and that it is possible to make one thing the very Form of all, and to hold that the others are not Forms; but thus all things will be one.

Now we have stated[1] that the question of definitions contains some difficulty, and why this is so. Therefore to reduce all things thus to Forms and to eliminate the matter is useless labour; for some things surely are a particular form in a particular matter, or particular things in a particular state. And the comparison which Socrates the younger[2] used to make in the case of 'animal'[3] is not good; for it leads away from the truth, and makes one suppose that man can possibly exist without his parts, as the circle can without the bronze. But the case is not similar; for an animal is something perceptible, and it is not possible to define it without reference to movement—nor, therefore, without reference to the parts and to their being in a certain state. For it is not a hand in *any* state that is a part of man, but the hand which can fulfil its work, which therefore must be alive; if it is not alive it is not a part.

Regarding the objects of mathematics, why are the formulae of the parts not parts of the formulae of the wholes, e.g. why

[1] Ch. V.

[2] Cf. Pl. *Theaet.* 147 C; *Soph.* 218 B; *Pol.* 257 C.

[3] Cf. 1036^a 34–^{b} 5.

are not the formulae of the semicircles parts of the formula of the circle? It cannot be said, 'because these parts are perceptible things'; for they are not. But perhaps this makes no difference; for even some things which are not perceptible
1037a must have matter; for there is some matter in everything which is not an essence and a bare form but an individual. The semicircles, then, will be parts, not of the universal circle, but of the individual circles, as has been said before; for while one kind of matter is perceptible, there is another which is intelligible.

It is clear also that the soul is the primary substance and the body is matter, and man or animal is the compound of both taken universally; and 'Socrates' or 'Coriscus', if even the soul of Socrates may be called Socrates,[1] has two meanings (for some mean by such a term the soul, and others mean the concrete thing), but if 'Socrates' or 'Coriscus' means simply this particular soul[2] and this particular body, the individual is analogous to the universal in its composition.[3]

Whether there is, apart from the matter of such substances, any other substance, and one should look for some substance other than these, e. g. numbers or something of the sort, must be considered later.[4] For it is for the sake of this that we are trying to determine the nature of perceptible substances, since in a sense the inquiry about perceptible substances is the work of physics, i. e. of second philosophy; for the physicist must not only know about the matter, but also about the substance in the sense of 'the formula', and even more than about the other. And in the case of definitions, how the elements in the formula are parts of the definition, and why the definition is one formula (for clearly the thing is one, but in virtue of *what* is the thing one, although it has parts?),—this must be considered later.[5]

What the essence is and in what sense it is independent, has been stated universally in a way which is true of every case, and also why the formula of the essence of some things

[1] 1037a 8 read ψυχὴ Σωκράτης, διττόν. Cf. 1036a 16–17, H. 1043b 2–4.
[2] 1037a 9 read ἁπλῶς ἡ ψυχή.
[3] i. e. as man = soul + body, Socrates = this soul + this body.
[4] Cf. Z. 13, 14, Λ, M, N.
[5] Cf. Z. 12, H. 6.

contains the parts of the thing defined, while that of others does not; and we have stated that in the formula of the substance the material parts will not be present (for they are not even parts of the substance in that sense, but of the concrete substance; but of this there is in a sense a formula, and in a sense there is not; for there is no formula of it with its matter, for this is indefinite, but there is a formula of it with reference to its primary substance—e.g. in the case of man the formula of the soul—, for the substance is the indwelling form, from which and the matter the so-called concrete substance is derived; e.g. concavity is a form of this sort, for from this and the nose arise 'snub nose' and 'snubness'; 'nose' will be found to be involved twice in these terms); but in the concrete substance, e.g. a snub nose or Callias, the matter also will be present. And we have stated that the essence and the individual thing are in some cases the same; i.e. in the case of primary sub- 1037b
stances, e.g. curvature and the essence of curvature, if this is primary. (By a 'primary' substance I mean one which does not imply the presence of something in something else, i.e. in a substrate which acts as matter.) But things which are of the nature of matter or of wholes which include matter, are not the same as their essences, nor are accidental unities[1] like that of 'Socrates' and 'musical'; for these are the same only by accident.

CHAPTER XII

Now let us treat first of definition, in so far as we have not treated of it in the *Analytics*[2]; for the problem stated in them is useful for our inquiries concerning substance. I mean this problem:—wherein consists the unity of that, the formula of which we call a definition, as for instance in the case of man, 'two-footed animal'; for let this be the formula of man. Why, then, is this one, and not many, viz. 'animal' *and* 'two-footed'? For in the case of 'man' and 'white' there is a plurality when one term does not belong to the other, but a unity when it does belong and the subject, man, has a certain

[1] 1037b 5 read οὐδ' εἰ κατὰ συμβεβηκός.
[2] Cf. *An. Post.* ii. 92a 29.

attribute; for then a unity is produced and we have 'the white man'. In the present case, on the other hand—that of 'animal' and 'two-footed'—one does not share in the other; the genus is not thought to share in its differentiae; for then the same thing would share in contraries; for the differentiae by which the genus is divided are contrary. And even if the genus does share in them, the same argument applies, since the differentiae present in man are many, e.g. endowed with feet, two-footed, featherless. Why are these one and not many? Not because they are present in one thing; for on this principle a unity can be made out of any set of attributes. But surely all the attributes in the definition *must* be one; for the definition is a single formula and a formula of substance, so that it must be a formula of some one thing; for substance means a 'one' and a 'this', as we maintain.

We must first inquire about definitions arising out of divisions. There is nothing in the definition except the first-named genus and the differentia[1]. The other genera are the first genus and along with this the differentiae that are taken with it, e.g. the first may be 'animal', the next 'animal which is two-footed', and again 'animal which is two-footed and featherless', and similarly if the definition includes more terms.
1038a And in general it makes no difference whether it includes many or few terms,—nor, therefore, whether it includes few or simply two; and of the two the one is differentia and the other genus, e.g. in 'two-footed animal' 'animal' is genus, and the other is differentia. If then the genus absolutely does not exist apart from the species which it as genus includes, or if it exists but exists as matter (for the voice is genus and matter, but its differentiae make the kinds, i.e. the letters, out of it), clearly the definition is the formula which comprises the differentiae.

But it is also necessary in division to take the differentia of the differentia; e.g. 'endowed with feet' is a differentia of 'animal'; again we must know the differentia of 'animal endowed with feet' *qua* endowed with feet. Therefore we must not say, if we are to speak rightly, that of that which is endowed with feet one part has feathers and one is featherless;

[1] 1037b 30 read καὶ ἡ διαφορά.

if we say this we say it through incapacity; we must divide it *qua*[1] cloven-footed or not-cloven; for these are differentiae in the foot; cloven-footedness is a form of footedness. And we always want to go on so till we come to the species that contain no differences. And then there will be as many kinds of foot as there are differentiae, and the kinds of animals endowed with feet will be equal in number to the differentiae. If then this is so, clearly the *last* differentia will be the substance of the thing and its definition, since it is not right to state the same things more than once in our definitions; for it is superfluous. And this does happen; for when we say 'animal which is endowed with feet, and two-footed' we have said nothing other than 'animal having feet, having two feet'; and if we divide this by the proper division, we shall be saying the same thing many times—as many times as there are differentiae.

If then a differentia of a differentia be taken at each step, one differentia—the last—will be the form and the substance; but if we divide according to accidental qualities, e. g. if we were to divide that which is endowed with feet into the white and the black, there will be as many differentiae as there are processes of division. Therefore it is plain that the definition is the formula which contains the differentiae, or, according to the right method, the last of these. This would be evident, if we were to change the order of such definitions, e. g. that of man, saying 'animal which is two-footed and endowed with feet'; for 'endowed with feet' is superfluous when 'two-footed' has been said. But order is no part of the substance; for how are we to think the one element posterior and the other prior? Regarding the definitions, then, which arise out of divisions, let this much be taken as stated in the first place as to their nature.

CHAPTER XIII

Let us again return to the subject of our inquiry, which is 1038b
substance. As the substrate and the essence and the compound of these are called substance, so also is the universal. About two of these we have spoken; about the essence and

[1] 1038a 14 read ἀλλ' ᾗ τὸ μέν.

about the substrate, of which we have said that it underlies in two senses, either being an individual thing—which is the way in which an animal underlies its attributes—, or as the matter underlies the complete reality. The universal also is thought by some to be in the fullest sense a cause, and a principle; therefore let us attack the discussion of this point also. For it seems impossible that any universal term should be the name of a substance. For primary substance is that kind of substance which is peculiar to an individual, which does not belong to anything else; but the universal is common, since that is called universal which naturally belongs to more than one thing. Of which individual then will this be the substance? Either of all or of none. But it cannot be the substance of all; and if it is to be the substance of one, this one will be the others also; for things whose substance is one and whose essence is one are themselves also one.

Further, substance means that which is not predicable of a subject, but the universal is predicable of some subject always.

But perhaps the universal, while it cannot be substance in the way in which the essence is so, can be present in this, e.g. 'animal' can be present in 'man' and 'horse'. Then clearly there is a formula of the universal. And it makes no difference even if there is not a formula of everything that is in the substance; for none the less the universal will be the substance of something. 'Man' is the substance of the individual man in whom it is present; therefore the same will happen again; for a substance, e.g. 'animal', must be the substance of that in which it is present as something peculiar to it. And further it is impossible and absurd that the individual, i.e. the substance, if it consists of parts, should not consist of substances nor of what is individual, but of quality; for that which is not substance, i.e. the quality, will then be prior to substance and to the individual. Which is impossible; for neither in formula nor in time nor in knowledge[1] can the affections be prior to the substance; for then they would be separable from it. Further, in Socrates there will be a substance[2] in a substance, so that he will be the substance of two things. And in

[1] 1038b 27 read οὔτε γνώσει οἷον. Cf. 1028a 32.

[2] Sc. 'man'.

general it follows, if man and such things[1] are substances, that none of the elements in their formulae is the substance of anything, nor does it exist apart from the species or in anything else; I mean, for instance, that no 'animal' exists apart from the particular animals, nor does any other of the elements present in formulae exist apart.

If, then, we view the matter from these standpoints, it is plain that no universal attribute is a substance, and this is plain also from the fact that no common predicate indicates 1039a a 'this', but rather a 'such'. If not, many difficulties follow and especially the 'third man'.[2]

The conclusion is evident also (1) from the following consideration—that a substance cannot consist of substances present in it actually (for things that are thus actually two are never actually one, though if they are *potentially* two, they can be one, e.g. the double line consists of two halves—potentially; for the *actualization* of the halves divides them from one another; therefore if the substance is one, it will not consist of substances present in it); and (2) according to the argument which Democritus states rightly; he says one thing cannot come from two nor two from one; for he identifies his indivisible magnitudes with substances. It is clear therefore that the same will hold good of number, if number is a synthesis of units, as is said by some; for 'two' is either not one, or there is no unit present in it actually.

The consequence of this view involves a difficulty. If no substance can consist of universals because a universal indicates a 'such', not a 'this', and if no substance can be composed of actual substances, every substance would be incomposite, so that there would not even be a formula of any substance. But it is thought by all and has been previously stated[3] that it is either only, or primarily, substance that can be defined; yet now it seems that not even substance can. There cannot, then, be a definition of anything; or rather in a sense there can be, and in a sense there cannot. And what we say will be plainer from what follows.[4]

[1] Sc. *infimae species*.
[2] Cf. A. 990^b 17.
[3] Cf. 1031^a 11.
[4] Cf. Z. 15, H. 6.

CHAPTER XIV

It is clear also from these very facts what consequences confront those who say the Ideas are substances and can exist apart, and at the same time make the Form consist of the genus and the differentiae. For if the Forms exist and 'animal' is present in 'man' and 'horse', it is either one and the same in number, or different. (In formula it is clearly one; for he who states the formula unfolds the same formula in either case.) If there is a 'man-in-himself' who is an individual and exists apart, the parts of which he consists, e.g. 'animal' and 'two-footed', must indicate individuals and be self-existents and substances; therefore 'animal', as well as 'man', must be of this sort.

Now (1) if 'animal', which is in 'the horse' and in 'man', is one and the same, as you are one and the same with yourself,
1039b how will the one in things that exist apart be one, and how will this 'animal' escape being divided even from itself?[1]

Further, (*a*) if it is to share in 'two-footed' and 'many-footed', an impossible conclusion follows; for contrary attributes will belong at the same time to it although it is one and an individual. (*b*) If it does not, what is the relation implied when one says the animal 'is two-footed' or 'has feet'? But perhaps these concepts are 'put together' and are 'in contact', or are 'mixed'. Yet all these expressions are absurd.

But (2) suppose the Form to be different in each species. Then there will be practically an infinite number of things whose *substance* is 'animal'; for it is not by accident that 'man' has 'animal' for one of its elements. Further, 'animal-in-itself' will be many. For (*a*) the 'animal' in each species will be the substance of the species; for it is not dependent on anything else; if it were, that other would be an element in 'man', i.e. would be the genus of man. And further (*b*) all the elements of which 'man' is composed will be Ideas. Now nothing can be the Idea of one thing and the substance of another; this is impossible. Each, then, of the Ideas present in the species of animals will be the ideal animal. Further, from what will these Ideas be derived; how will

[1] 1039b 1 read χωρὶς αὑτοῦ.

they be derived from the ideal animal[1]? Or how can an Idea of 'animal' whose essence is simply 'animal'[2] exist apart from the ideal animal? Further, in the case of sensible things both these consequences and others still more absurd follow. If, then, these consequences are impossible, clearly there are not Forms of sensible things in the sense in which some maintain their existence.

CHAPTER XV

Since substance is of two kinds, the concrete thing and the formula (I mean that one kind of substance is the formula taken with the matter, while another kind is the formula in its generality), substances in the former sense are capable of destruction (for they are capable also of generation), but there is no destruction of the formula in the sense that it is ever in course of being destroyed; for there is no generation of it (the being of house is not generated, but only the being of *this* house), but without generation and destruction formulae are and are not; for it has been shown[3] that no one produces nor makes these. For this reason, also, there is neither definition nor demonstration of sensible individual substances, because they have matter whose nature is such that they are capable both of being and of not being; for which reason all the individual instances of them are destructible. If then demonstration is of necessary truths and definition is a scientific process, and if, just as knowledge cannot be sometimes knowledge and sometimes ignorance, but the state which varies thus is opinion, so too demonstration and definition cannot vary thus, but it is opinion that deals with that which can be otherwise than as it is, clearly there can neither be definition nor demonstration of sensible individuals. For perishing things are obscure to those who have knowledge of them, when they have passed from our perception; and though the formulae remain in the soul unchanged, there will no longer be either definition or demonstration. Therefore when one of those who aim at definition defines any individual,

[1] 1039b 15 read αὐτοῦ ζῴου;
[2] 1039b 15 read ζῷον, ᾧ οὐσία τοῦτο αὐτό.
[3] Ch. VIII.

he must recognize that his definition may always be overthrown; for it is not possible to define such things.

Nor is it possible to define any Idea. For the Idea is, as its supporters say, an individual, and can exist apart; and the formula must consist of words; and he who defines must not invent a word (for it would be unknown), but the established words are common to each of a number of things; these then must apply to something besides the thing defined; e.g. if one were defining you, he would say 'an animal which is lean' or 'white', or something else which will apply also to some one other than you. If any one were to say that perhaps all the attributes taken apart may belong to many subjects, but together they belong only to this one, we must reply firstly that they belong also to both the elements, e.g. 'two-footed animal' belongs to animal and to the two-footed. And where the elements are eternal this is even necessary, since the elements are prior to and parts of the compound; nay more, they can also exist apart, if 'man' can exist apart. For either neither or both can. If, then, neither can, the genus will not exist apart from the species; but if it does, the differentia will also. Secondly, we must reply that 'animal' and 'two-footed' are prior in being to 'two-footed animal'; and things which are prior to others are not destroyed when the others are.

Again, if the Ideas consist of Ideas (as they must, since elements are simpler than the compound), it will be further necessary that the elements of which the Idea consists, e.g. 'animal' and 'two-footed', should be predicated of many subjects. If not, how will they be known? For there will then be an Idea which cannot be predicated of more subjects than one. But this is not thought possible—every Idea is thought to be capable of being shared.

As has been said, then, people do not realize that it is impossible to define in the case of eternal things, especially those which are unique, like the sun or the moon. For they err not only by adding attributes after whose removal the sun would still exist, e.g. 'going round the earth' or 'night-hidden' (for from their view it follows that if it stands still or is visible,[1] it will no longer be the sun; but it is strange if this

[1] Sc. at night. 1040a 32 omit ἀεί.

is so; for 'the sun' means a certain *substance*); but also by the mention of attributes which can belong to another subject; e.g. if another thing with the stated attributes comes into existence, clearly it will be a sun; the formula therefore is general. But the sun was supposed to be an individual, like 1040b
Cleon or Socrates. Why does not one of the supporters of the Ideas produce a definition of an Idea? It would become clear, if they tried, that what has now been said is true.

CHAPTER XVI

Evidently even of the things that are thought to be substances, most are only potencies,—e.g. the parts of animals (for none of them exists separately; and when they *are* separated, then they too exist, all of them, merely as matter) and earth and fire and air; for none of them is one, but they are like a heap[1] before it is fused by heat and some one thing is made out of the bits. One might suppose especially that the parts of living things and the corresponding parts of the soul are both, i.e. exist in complete reality as well as in potency, because they have sources of movement in something in their flexures; for which reason some animals live when divided. Yet all the parts must exist only potentially, when they are one and continuous by nature,—not by force or even by growing together, for such a phenomenon is an abnormality.

Since the term 'unity' is used like the term 'being', and the substance of that which is one is one, and things whose substance is numerically one are numerically one, evidently neither unity nor being can be the substance of things, just as being an element or a principle cannot be the substance, but we seek *what* the principle is, that we may reduce the thing to something more intelligible. Now of these concepts 'being' and 'unity' are more substantial than 'principle' or 'element' or 'cause', but not even the former are substance, since in general nothing that is common is substance; for substance does not belong to anything but to itself[2] and to that which has it, of which it is the substance.

[1] 1040b 9 read οἷον ὁ σωρός.
[2] 1040b 24 read ᾗ αὑτῇ τε.

Further, that which is one cannot be in many things at the same time, but that which is common is present in many things at the same time; so that clearly no universal exists apart from the individuals.

But those who say the Forms exist, in one respect are right, in saying the Forms exist apart, if they are substances; but in another respect they are not right, because they say the one *in* many is a Form. The reason for their doing this is that they cannot say what are the substances of this sort, the imperishable substances which exist apart from the individual and sensible substances. They make them, then, the same in kind as the perishable things (for this kind of substance we know)—'man himself' and the 'horse itself', adding to the sensible things the word 'itself'. Yet even if we had not
1041a seen the stars, none the less, I suppose, would there be eternal substances besides those things[1] which we knew; so that now also if we do not know what eternal substances there are, yet it is doubtless necessary that some should exist. Clearly, then, no universal term is the name of a substance, and no substance is composed of substances.

CHAPTER XVII

Let us state what should be said to be the genus and the differentia of substance, taking another starting-point; for perhaps from this we shall get a clear view also of that substance which exists apart from sensible substances. Since, then, substance is a principle and a cause, let us attack it from this standpoint. The 'why' is always sought in this form—'why does an attribute attach to a subject?' For to inquire why the musical man is a musical man, is either to inquire—as we have said—why the man is musical,[2] or it is something else. Now 'why a thing is itself' is doubtless a meaningless inquiry; for ⟨to give meaning to the question 'why',⟩ the fact or the existence of the thing must already be evident (e. g. that the moon is eclipsed), but the fact that a thing is itself is

[1] 1041a 2 read παρ' ἅ.
[2] 1041a 13 read διὰ τί ὁ ἄνθρωπος μουσικός ἐστιν.

the single reason and the single answer to all such questions as 'why the man is man, or the musical musical',[1] unless one were to answer 'because each thing is inseparable from itself'; and its being one just meant this. This, however, is common to all things and is a 'short and easy way' with the question. But we *can* inquire why man is an animal of such and such a nature. Here, then, we are evidently not inquiring why he who is a man is a man. We are inquiring, then, why something is predicable of something; that it is predicable must be clear; for if not, the inquiry is an inquiry into nothing. E.g. why does it thunder? This is the same as 'why is sound produced in the clouds?' Thus the inquiry is about the predication of one thing of another. And why are certain things, i.e. stones and bricks, a house? Plainly we are seeking the cause. And this is the essence (to speak abstractly), which in some cases is the end, e.g. perhaps in the case of a house or a bed, and in some cases is the first mover; for this also is a cause. But while the efficient cause is sought in the case of genesis and destruction, the final cause is sought in the case of being also.

The object of the inquiry is most overlooked where one term is not expressly predicated of another[2] (e.g. when we 1041b
inquire why man is), because we do not distinguish and do not say definitely 'why do these parts form this whole?' But we must distinguish the elements in the concept before we begin to inquire; if not, it is not clear whether the inquiry is significant or unmeaning. Since we must know the existence of the thing and it must be given, clearly the question is *why* the matter is some individual thing, e.g. why are these materials a house? Because that which was the essence of a house is present. And why is this individual thing, or this body in this state, a man? Therefore what we seek is the cause, i.e. the form, by reason of which the matter is some definite thing; and this is the substance of the thing. Evidently, then, in the case of *simple* terms no inquiry nor teaching is possible; our attitude towards them is other than that of inquiry.

[1] Sc. and therefore in this case, when the fact is known, there is no question as to the 'why'.

[2] 1041a 33 read κατ' ἀλλήλων.

As regards[1] that which is compounded out of something so that the whole is one—not like a heap, however, but like a syllable,—the syllable is not its elements, *ba* is not the same as *b* and *a*, nor is flesh fire and earth; for when they are dissolved the wholes, i. e. the flesh and the syllable, no longer exist, but the elements of the syllable exist, and so do fire and earth. The syllable, then, is something—not only its elements (the vowel and the consonant) but also something else; and the flesh is not only fire and earth or the hot and the cold, but also something else. Since, then, that something must be either an element or composed of elements, (1) if it is an element the same argument will again apply; for flesh will consist of this and fire and earth and something still further, so that the process will go on to infinity; while (2) if it is a compound, clearly it will be a compound not of one but of many (or else it will itself be that one),[2] so that again in this case we can use the same argument as in the case of flesh or of the syllable. But it would seem that this 'other' is something, and not an element, and that it is the cause which makes *this* thing flesh and *that* a syllable. And similarly in all other cases. And this is the substance of each thing; for this is the primary cause of its being; and since, while some things are not substances, as many as are substances are formed by nature,[3] their substance would seem to be this 'nature',[4] which is not an element but a principle. An *element* is that into which a thing is divided and which is present in it as matter, e. g. *a* and *b* are the elements of the syllable.

[1] Not even the protasis of the sentence beginning 1041b 11 is ever completed; the parenthesis beginning *ἡ δὲ συλλαβή*, l. 12, is so long that the original construction is forgotten.

[2] 1041b 23 read *πλειόνων* (*ἢ ἐκεῖνο αὐτὸ ἔσται*).

[3] 1041b 29 omit *κατὰ φύσιν καί*.

[4] Sc. the formal cause.

BOOK VIII (H)

CHAPTER I

WE must draw our conclusions from what has been said, 1042a and sum up our results, and put the finishing touch to our inquiry. We have said[1] that the causes, principles, and elements of substances are the object of our search. And some substances are recognized by all thinkers, but some have been advocated by particular schools. Those generally recognized are the natural substances, i. e. fire, earth, water, air, &c., the simple bodies; secondly, plants and their parts, and animals and the parts of animals; and finally the heavens and the parts of the heavens; while some particular schools say that Forms and the objects of mathematics are substances.[2] And it follows from our arguments that there are other substances, the essence and the substratum.[3] Again, in another way the genus seems more substantial than the species, and the universal than the particulars.[4] And with the universal and the genus the Ideas are connected; it is in virtue of the same argument that they are thought to be substances.[5] And since the essence is substance, and the definition is a statement of the essence, for this reason we have discussed[6] definition and essential predication. Since the definition is a formula, and a formula has parts, we had to consider[7] with respect to the notion of 'part', what are parts of the substance and what are not, and whether the same things are also parts of the definition. Further, then,[8] neither the universal nor the genus is a substance; we must inquire later[9] into the Ideas and the objects of mathematics; for some say these exist apart from sensible substances.

But now let us resume the discussion of the generally

[1] Cf. Z. 1. [2] Cf. Z. 2. [3] Cf. Z. 3, 4. [4] Cf. Z. 13.
[5] Cf. Z. 14. [6] Cf. Z. 4, 5, 12. [7] Cf. Z. 10, 11.
[8] 1042a 21 read ἔτι τοίνυν. Cf. Z. 13. [9] Cf. M and N.

recognized substances. These are the sensible substances, and sensible substances all have matter. The substratum is substance, and this is in one sense the matter (and by matter I mean that which, not being a 'this' actually, is potentially a 'this'), and in another sense the formula or form (which being a 'this' can be separately formulated), and thirdly the complex of matter and form, which alone is generated and destroyed, and is, without qualification, capable of separate existence; for of substances in the sense of formulae some are separable and some are not.

But clearly matter also is substance; for in all the opposite changes that occur there is something which underlies the changes, e.g. in respect of place that which is now here and again elsewhere, and in respect of increase that which is now of one size and again less or greater, and in respect of alteration that
1042b which is now healthy and again diseased; and similarly in respect of substance there is something that is now being generated and again being destroyed, and now[1] underlies the process as a 'this' and again[2] underlies it as the privation of positive character. In this last change the others are involved. But in either one or two of the others this is not involved; for it is not necessary if a thing has matter for change of place that it should also have matter for generation and destruction.

CHAPTER II

The difference between becoming in the full sense and becoming in a qualified sense has been stated in our works on Physics.[3] Since the substance which exists as substratum and as matter is generally recognized, and this is that which exists potentially, it remains for us to say what is the substance, in the sense of *actuality*, of sensible things. Democritus seems to think there are three kinds of difference between things; the underlying body, the matter, is one and the same, but they differ either in rhythm, i. e. shape, or in turning, i. e. position, or in inter-contact, i. e. order.[4] But evidently there are many differences; for instance, some things are characterized

[1] Sc. in the case of destruction. [2] Sc. in the case of generation.
[3] Cf. *Phys.* v. 1, *De Gen. et Corr.* i. 2, 3. [4] Cf. A. 985b 13.

by the mode of composition of their matter, e. g. the things formed by mixture, such as honey-water; and others by being bound together, e. g. a bundle; and others by being glued together, e. g. a book; and others by being nailed together, e. g. a casket; and others in more than one of these ways; and others by position, e.g. the threshold and the lintel (for these differ by being placed in a certain way); and others by time, e. g. dinner and breakfast; and others by place, e. g. the winds; and others by the affections proper to sensible things, e. g. hardness and softness, density and rarity, dryness and wetness; and some things by some of these qualities, others by them all, and in general some by excess and some by defect. Clearly then the word 'is' has just as many meanings; a thing is a threshold because it lies in such and such a position, and its being means its lying in that position, while being ice means having been solidified in such and such a way. And the being of some things will be defined by *all* these qualities, because some parts of them are mixed, others are fused, others are bound together, others are solidified, and others possess the other differentiae; e. g. the hand or the foot requires such complex definition. We must grasp, then, the kinds of differentiae (for these will be the principles of the being of things), e. g. the things characterized by the more and the less, or by the dense and the rare, and by other such qualities; for all these are characterized by excess and defect. And everything that is characterized by shape or by smoothness and roughness, is determined by the straight and the curved. And for other things their being will mean their being mixed, and their not 1043a
being will mean the opposite. It is clear then from these facts that if its substance is the cause of each thing's being, we must seek in these differentiae the cause of the being of each of these things. Now none of these differentiae is substance, even when coupled with matter, yet in each there is something analogous to substance; and as in substances that which is predicated of the matter is the actuality itself, in all other definitions also it is what most resembles full actuality. E. g. if we had to define a threshold, we should say 'wood or stone in such and such a position', and a house we should define as

'bricks and timbers in such and such a position' (or we may name the purpose as well in some cases), and if we define ice we say 'water frozen or solidified in such and such a way', and harmony is 'such and such a blending of high and low'; and similarly in all other cases.

Obviously then the actuality or the formula is different when the matter is different; for in some cases it is the juxtaposition, in others the mixing, and in others some other of the attributes we have named. And so, in defining, those who define a house as stones, bricks, and timbers, are speaking of the potential house, for these are the matter; but those who define it as a covering for animals and chattels, or add some other similar differentia, speak of the actuality;[1] and those who combine both of these speak of the third kind of substance, which is composed of matter and form. For the formula that gives the differentiae seems to be an account of the form and the actuality, while that which gives the components is rather an account of the matter. And the same is true with regard to the definitions which Archytas used to accept; for they are accounts of the combined form and matter. E.g. what is still weather? Absence of motion in a large extent of air; air is the matter, and absence of motion is the actuality and substance. What is a calm? Smoothness of sea; the material substratum is the sea, and the actuality or form is smoothness. It is obvious then, from what has been said, what sensible substance is and how it exists—one kind of it as matter, another as form or actuality; while the third kind is that which is composed of these two.

CHAPTER III

We must not forget that sometimes it is not clear whether a name means the composite substance, or the actuality or form, e.g. whether 'house' is a sign for the composite thing, 'a covering consisting of bricks and stones laid thus and thus,' or for the actuality or form, 'a covering,' and whether a line is 'twoness in length' or 'twoness', and whether an animal is 'a soul in a body' or 'a soul'. For soul is the

[1] 1043ᵃ 18 read τὴν ἐνέργειαν.

substance or actuality of some body; but 'animal' might be applied to both, not that both are definable by one formula but because they refer to the same thing. But this question,[1] while important for another purpose, is of no importance for the inquiry into sensible substance; for the essence certainly 1043b attaches to the form and the actuality. For 'soul' and 'to be soul' are the same, but 'to be man' and 'man' are not the same, unless indeed the soul is to be called man; and thus on one interpretation the thing is the same as its essence, and on another it is not.

If we consider[2] we find that the syllable is not produced by the letters + juxtaposition, nor is the house bricks + juxtaposition. And this is right; for the juxtaposition or mixing is not produced by those things of which it is the juxtaposition or mixing. And the same is true in the other cases, e.g. if the threshold is characterized by its position, the position is not produced by the threshold, but rather the latter is produced by the former. Nor is man animal + biped, but there must be something besides these, if these are matter,—something which is neither an element in the whole nor produced by an element, but is the substance, which people state when they eliminate the matter. If then this is the cause of the thing's being, and if the cause of its being is its substance,[3] they must be stating the substance itself.

This, then, must either be eternal or it must be destructible without being ever in course of being destroyed, and must have come to be without ever being in course of coming to be. But it has been proved and explained elsewhere[4] that no one makes or generates the form, but it is the individual that is made, i.e. the complex of form and matter that is generated. Whether the substances of destructible things can exist apart, is not yet at all clear; except that obviously this is impossible in some cases—in the case of things which cannot exist apart from the individual instances, e.g. house or utensil. Perhaps neither these things themselves, nor any of the other things which are not formed by nature, are substances at all; for one

[1] Sc. whether the name means the form or the concrete thing.
[2] Aristotle returns to the subject discussed in Chapter II.
[3] 1043b 14 read *οὐσία τοῦτο, αὐτήν*. Cf. Δ. 1017b 14–15.
[4] Cf. Z. 8.

might say that the nature in natural objects is the only substance to be found in destructible things.

Therefore the difficulty which was raised by the school of Antisthenes and other such uneducated people has a certain appropriateness. They stated that the 'what' cannot be defined (for the definition so called is a 'long formula' [1]); but of what *sort* a thing, e. g. silver, is, they thought it possible to explain, not saying what it is but that it is like tin. Therefore one kind of substance can be defined and formulated, i. e. the composite kind, whether it be the object of sense or of reason; but the primary parts of which this consists cannot be defined, since a definitory formula predicates something of something, and one part of the definition must play the part of matter and the other that of form.

It is also obvious that, if all substances are in a sense numbers, they are so in this sense and not, as some say, as numbers of units. For definition is a sort of number; for (1) it is divisible, and into indivisible parts (for definitory formulae are not infinite), and number also is of this nature. And (2) as, when one of the parts of which a number consists has been taken from or added to the number, it is no longer the same number, but a different one, even if it is the very smallest
1044a part that has been taken away or added, so the definition and the essence will no longer remain when anything has been taken away or added. And (3) the number must have something in virtue of which it is one, while our opponents cannot say what makes it one (for it is not one [2] but a sort of heap, or if it is, we ought to say what it is that makes one out of many); and the definition is one, but similarly they cannot say what makes *it* one. And this is natural; for the same reason is applicable, and substance is one in the sense which we have explained, and not, as some say, by being a sort of unit or point; each is a complete reality and a definite nature. And as number does not admit of the more and the less, neither does substance, in the sense of form, but if any substance does, it is only the substance which involves matter.

[1] Sc. and therefore cannot give the essence, which is simple. For the contemptuous meaning of *μακρὸς λόγος* cf. N. 1091a 8.

[2] 1044a 4 read *τίνι εἷς· εἷς γὰρ οὐκ ἔστιν.*

Let this then suffice for an account of the generation and destruction of so-called substances—in what sense it is possible and in what sense impossible—and of the reduction of things to number.

CHAPTER IV

Regarding material substance we must not forget that even if all things come from the same first cause[1] or have the same things for their first causes, and if the same matter serves as starting-point for their generation, yet there is a matter proper to each, e.g. the sweet or the fat is the proximate matter of phlegm, and the bitter, or something else, that of bile; though perhaps these come from the same original matter. And there come to be several matters for the same thing, when the one matter is matter for the other, e.g. phlegm comes from the fat and from the sweet, if the fat comes from the sweet; and it comes from bile by analysis of the bile into its ultimate matter. For one thing comes from another in two senses, either because it will be found at a later stage of development, or because it is produced if the other is analysed into its original constituents. When the matter is one, different things may be produced owing to difference in the moving cause, e.g. from wood may be made both a chest and a bed. But *some* different things must have their matter different, e.g. a saw could not be made of wood, nor is this in the power of the moving cause; for it could not make a saw of wool or of wood. But if, as a matter of fact, the same thing can be made of different material, clearly the art, i.e. the moving principle, is the same; for if both the matter and the moving principle were different, the product would be too.

When one inquires what is the cause, one should, as 'causes' are spoken of in several senses, state all the possible causes. E.g. what is the material cause of man? The *menses*. What is the moving cause? The *semen*. The formal cause? His essence. The final cause? His end.
But perhaps the latter two are the same.—We must state 1044b
the *proximate* causes. What is the material cause? Not fire or earth, but the matter peculiar to the thing.

[1] Sc. material cause.

Regarding *generable* natural substances, *if* the causes are really these and of this number and we have to learn the causes, we must inquire thus, if we are to inquire rightly. But in the case of natural but *eternal* substances another account must be given. For perhaps some have no matter, or not matter of this sort but only such as can be moved in respect of place. Nor does matter belong to those things which exist by nature but are not substances; their substratum is the *substance*. E. g. what is the cause of an eclipse? What is its matter? There is none; the *moon* is that which suffers eclipse.[1] What is the moving cause which extinguishes the light? The earth. The final cause perhaps does not exist. The formal principle is the definitory formula, but this is obscure if it does not include the cause.[2] E. g. what is eclipse? Deprivation of light. But if we add 'by interposition of the earth', this is the formula which includes the cause. In the case of sleep it is not clear what it is that proximately has this affection. Surely the animal, it will be said. Yes, but the animal in virtue of what, i. e. what is the proximate subject? The heart or some other part. Next, by what is it produced? Next, what is the affection—that of the proximate subject, not of the whole animal? Shall we say that it is immobility of such and such a kind? Yes, but to what process in the proximate subject is this due?

CHAPTER V

Since some things are and are not, without coming to be and ceasing to be, e. g. points, if they can be said to *be*, and in general forms and shapes (for it is not 'white' that comes to be, but the wood comes to be white, if everything that comes to be comes from something and comes to be something), not all contraries can come from one another, but it is in different senses that a white man comes from a black man, and white comes from black. Nor has everything matter, but only those things which come to be and change

[1] i. e. the substratum of a substance is bare matter, but the substratum of an attribute is a determinate substance such as the moon.
[2] Sc. the efficient cause.

into one another. Those things which, without ever being in course of changing, are or are not, have no matter.

There is difficulty in the question how the matter of each thing is related to its contrary states. E.g. if the body is potentially healthy, and disease is contrary to health, is it potentially both healthy and diseased? And is water potentially wine and vinegar? We answer that it is the matter of one in virtue of its positive state and its form, and of the other in virtue of the privation of its positive state and the corruption of it contrary to its nature. It is also hard to say why wine is not said to be the matter of vinegar nor potentially vinegar (though vinegar is produced from it), and why the living man is not said to be potentially dead. In fact they are not, but the corruptions in question are accidental, and it is the matter of the animal that is itself[1] in virtue of 1045a
its corruption the potency and matter of a corpse, and it is water that is the matter of vinegar. For the one comes from the other as night from day. And *all* the things which change thus into one another must be reduced to their matter, e.g. if from a corpse is produced an animal, the corpse is first reduced to its matter, and only then becomes an animal; and vinegar is first reduced to water, and only then becomes wine.

CHAPTER VI

To return to the difficulty which has been stated[2] with respect to definitions and numbers, what is the cause of the unity of each of them? In the case of all things which have several parts and in which the whole is not, as it were, a mere heap, but the totality is something besides the parts, there is a cause of unity; for as regards material things contact is the cause in some cases, and in others viscidity or some other such quality. And a definition is a set of words which is one not by being connected together, like the *Iliad*, but by dealing with one object.—What then is it that makes man one; why is he one and not many, e.g. animal + biped, especially if there are, as some say, an ideal animal and an ideal biped? Why are

[1] 1045a 1 read αὐτή.

[2] Cf. Z. 12, H. 1044a 3-6.

not those Ideas the ideal man[1], so that men would exist by participation not in man, nor in one Idea, but in two, animal and biped? And in general man would be not one but more than one thing, animal and biped.

Clearly, then, if people proceed thus in their usual manner of definition and speech, they cannot explain and solve the difficulty. But if, as we say, one element is matter and another is form, and one is potentially and the other actually, the question will no longer be thought a difficulty. For this difficulty is the same as would arise if 'round bronze' were the definition of *X*;[2] for this symbol would be a sign of the definitory formula, so that the question is, what is the cause of the unity of 'round' and 'bronze'? The difficulty disappears, because the one is matter, the other form. What then is the cause of this—the reason why that which was potentially is actually,—what except, in the case of things which are generated, the agent? For there is no other reason why the potential sphere becomes actually a sphere, but this was the essence of either.[3] Of matter some is the object of reason, some of sense, and part of the formula is always matter and part is actuality, e.g. the circle is (1) a figure which (2) is plane.[4] But of the things which have no matter,
1045b either for reason or for sense, each is by its nature essentially a kind of unity, as it is essentially a kind of being—individual substance, quality, or quantity. And so neither 'existent' nor 'one' is present in definitions, and an essence is by its very nature a kind of unity as it is a kind of being. This is why none of these has any reason outside itself for being one, nor for being a kind of being; for each is by its nature a kind of being and a kind of unity, not as being in the genus 'being' or 'one' nor in the sense that being and unity can exist apart from particulars.

Owing to the difficulty about unity some speak of 'partici-

[1] 1045a 17 read αὐτοάνθρωπος.

[2] '*X*' is used to represent the Greek ἱμάτιον, lit. 'cloak.' Cf. Z. 1029b 28, *de Int.* 18a 9.

[3] i.e. it was the essence of form to unite with matter, and of matter to unite with form.

[4] The definition is incomplete, but sufficient to show the presence of matter (genus) and form (differentia).

pation', and raise the question, what is the cause of participation and what is it to participate; and others speak of 'communion',[1] as Lycophron says knowledge is a communion of knowing with the soul; and others say life is a 'composition' or 'connexion' of soul with body. Yet the same account applies to all cases; for being healthy will be either a communion or a connexion or a composition of soul and health, and the fact that the bronze is a triangle will be a composition of bronze and triangle, and the fact that a thing is white will be a composition of surface and whiteness. —The reason is that people look for a unifying formula, and a difference, between potency and complete reality. But, as has been said, the proximate matter and the form are one and the same thing, the one potentially, the other actually. Therefore to ask the cause of their being one is like asking the cause of unity in general; for each thing is a unity, and the potential and the actual are somehow one. Therefore there is no other cause here unless there is something which caused the movement from potency into actuality. And all things which have *no* matter are *without qualification* essentially unities.

[1] 1045b 10 omit ψυχῆς.

BOOK IX (Θ)

CHAPTER I

We have treated of that which *is* primarily and to which all the other categories of being are referred—i. e. of substance. For it is in virtue of the concept of substance that the others are said to be—quantity and quality and the like; for all will be found to involve the concept of substance, as we said in the first part of our work.[1] And since 'being' is in one way divided into 'what', quality, and quantity, and is in another way distinguished in respect of potency and complete reality, and of function, let us discuss potency and complete reality. First let us explain potency in the strictest sense, which is, however, not the most useful[2] for our present purpose. For potency and actuality extend further than the mere sphere of motion. But when we have spoken of this first kind, we shall in our discussions of actuality[3] explain the other kinds of potency.

We have pointed out elsewhere[4] that 'potency' and the word 'can' have several senses. Of these we may neglect all the potencies that are so called by an equivocation. For some are called so by analogy, as in geometry; and[5] we say things can be or cannot be because in some definite way they are or are not.

But all potencies that conform to the same type are starting-points, and are called potencies in reference to one primary kind of potency, which is a starting-point of change in another thing or in the thing itself *qua* other. For one kind is a potency of being acted on, i. e. the principle in the very thing acted on, which makes it capable of being changed and acted on by another thing or by itself regarded as other; and another kind

[1] Cf. Γ. 1003^a 33 and Z. 1.
[2] 1045^b 36 read χρησιμωτάτη.
[3] Cf. Θ. 1048^a 27.
[4] Cf. Δ. 12.
[5] 1046^a 7 read colon after γεωμετρίᾳ. Cf. Δ. 1019^b 22–33 and note.

is a state of insusceptibility to change for the worse and to destruction by another thing or by the thing itself *qua* other, i. e. by a principle of change. In all these definitions is implied the formula of potency in the primary sense.—And again these so-called potencies are potencies either of acting merely or of being acted on, or of acting or being acted on *well*, so that even in the formulae of the latter the formulae of the prior kinds of potency are somehow implied.

Obviously, then, in a sense the potency of acting and of being acted on is one (for a thing may be 'capable' either because it can be acted on or because something else can be acted on by it), but in a sense the potencies are different. For the one is in the thing acted on; it is because it contains a certain motive principle, and because even the matter is a motive principle, that the thing acted on is acted on, one thing by one, another by another; for that which is oily is *inflammable*, and that which *yields* in a particular way can be *crushed*;[1] and similarly in all other cases. But the other potency is in the agent, e. g. heat and the art of building are present, one in that which can produce heat and the other in the man who can build. And so in so far as a thing is an organic unity, it cannot be acted on by itself; for it is one and not two different things. And want of potency, or powerlessness, is the privation which is contrary to potency of this sort, so that every potency belongs to the same subject and refers to the same process as a corresponding want of potency. Privation has several senses; for it means (1) that which has not a certain quality and (2) that which might naturally have it but has not it, either (*a*) in general or (*b*) when it might naturally have it, and either (i) in some particular way, e. g. when it *completely* fails to have it, or (ii) when it in any degree fails to have it. And in certain cases if things which naturally have a quality lose it by violence, we say they suffer privation.

[1] i. e. the event would not happen if the passive factor were different. What is oily cannot necessarily be crushed, nor what is yielding burnt.

CHAPTER II

Since some such principles are present in soulless things, and others in things possessed of soul, and in soul and in the
1046b rational part of the soul, clearly some potencies will be non-rational and some will be accompanied by knowledge of a rational formula. This is why all arts, i. e. all productive forms of knowledge, are potencies; they are principles of change in another thing or in the artist himself considered as other.

And each of those which are accompanied by reason is alike capable of contrary effects, but one non-rational power produces one effect; e. g. the hot is capable only of heating, but the medical art can produce both disease and health. The reason is that science is a rational formula, and the same rational formula explains a thing and its privation, only not in the same way; and in a sense it applies to both, but in a sense it applies rather to the positive fact. Therefore such sciences must deal with contraries, but with one in virtue of their own nature and with the other not in virtue of their nature; for the rational formula applies to one object in virtue of that object's nature, and to the other, in a sense, accidentally. For it is by denial and removal that it explains the contrary; for the contrary is the primary privation, and this is the entire removal of the positive term. Now since on the one hand contraries do not occur in the same point of reality, but on the other hand science is a potency which depends on the possession of a rational formula, and the soul possesses a principle of movement; therefore, on the one hand, the wholesome produces only health and the calorific only heat and the frigorific only cold, but the scientific man, on the other hand, produces both the contrary effects. For there is a rational formula which applies to both, though not in the same way, and it is in a soul which possesses a principle of movement; so that the soul will start both processes from the same principle, applying them to the same object. And so the things whose potency is according to a rational formula act contrariwise to the things whose potency is non-rational; for the products of the former are included under one principle, the rational formula.

It is obvious also that the potency of merely doing a thing or having it done to one is implied in that of doing it or having it done *well*, but the latter is not always implied in the former: for he who does a thing well must do it, but he who does it merely need not do it well.

CHAPTER III

There are some who say, as the Megaric school does, that a thing 'can' act only when it is acting, and when it is not acting it 'cannot' act, e.g. he who is not building cannot build, but only he who is building, when he is building; and so in all other cases. It is not hard to see the absurdities that attend this view.

For it is clear that on this view a man will not be a builder unless he is building (for to be a builder is to be able to build), and so with the other arts. If, then, it is impossible to have such arts if one has not at some time learnt[1] and acquired them, and it is then impossible not to have them if one has not sometime lost them (either by forgetfulness or by some 1047a
accident or by time; for it cannot be by the destruction of the object itself,[2] for that lasts for ever), a man will not have the art when he has ceased to use it, and yet he may immediately build again; how then will he have got the art[3]? And similarly with regard to lifeless things; nothing will be either cold or hot or sweet or perceptible at all if people are not perceiving it; so that the upholders of this view will have to maintain the doctrine of Protagoras. But, indeed, nothing will even have perception if it is not perceiving, i.e. exercising its perception. If, then, that is blind which has not sight though it would naturally have it, when it would naturally have it and when it still exists, the same people will be blind many times in the day—and deaf too.

Again, if that which is deprived of potency is incapable, that

[1] 1046b 37 read μαθόντα.

[2] The object of knowledge is always a form, which is eternal. The matter which makes things perishable is no object for knowledge.

[3] The protasis here states facts, the apodosis states a conclusion which follows from the Megaric theory, and the final question states a difficulty which follows from the apodosis.

which is not happening[1] will be incapable of happening; but he who says of that which is incapable of happening that it is or will be will say what is untrue; for this is what incapacity meant. Therefore these views do away with both movement and becoming. For that which stands will always stand, and that which sits will always sit; if it is sitting it will not get up; for that which, as we are told, cannot get up will be incapable of getting up. But we cannot say this, so that evidently potency and actuality are different; but these views make potency and actuality the same, so that it is no small thing they are seeking to annihilate.

Therefore it is possible that a thing may be capable of being and not *be*, and capable of not being and yet *be*, and similarly with the other kinds of predicate; it may be capable of walking and yet not walk, or capable of not walking and yet walk.[2] And a thing is capable of doing something if there is nothing impossible in its having the actuality of that of which it is said to have the capacity. I mean for instance, if a thing is capable of sitting and it is open to it to sit, there will be nothing impossible in its actually sitting; and similarly if it is capable of being moved or moving or of standing or making to stand or of being or coming to be, or of not being or not coming to be.

The word 'actuality', which we connect with 'complete reality', has, strictly speaking, been extended from movements to other things; for actuality[3] in the strict sense is identified with movement. And so people do not assign movement to non-existent things, though they do assign some other predicates. E.g. they say that non-existent things are objects of thought and desire, but not that they are moved; and this because, while *ex hypothesi* they do not actually exist, they would have to exist actually if they were moved.
1047b For of non-existent things some exist potentially; but they do not *exist*, because they do not exist in complete reality.

[1] 1047a 11 read γινόμενον.
[2] 1047a 23 read καὶ μὴ βαδίζειν δυνατὸν εἶναι βαδίζον, following A. Bullinger.
[3] 1047a 32 read ἡ ἐνέργεια.

CHAPTER IV

If what we have described[1] is identical with the capable[2] in so far as the two things are logically convertible, evidently it cannot be true to say 'this is capable of being but will not be',—a view which leads to the conclusion that there is nothing incapable of being. Suppose, for instance, that a man (one who did not understand the meaning of 'incapable of being') were to say that the diagonal of the square is capable of being measured but will not be measured, because a thing may be capable of being or coming to be, and yet not be or be about to be. But from the premises this necessarily follows, that if we actually suppose that which is not, but is capable of being, to be or to have come to be, there will be nothing impossible in this; but the result *will* be impossible, for the actual measuring of the diagonal is impossible. For the false and the impossible are not the same; that you are standing now is false, but that you should be standing is not impossible.

At the same time it is clear that if, when *A* is real, *B* must be real, then, when *A* is possible,[3] *B* also must be possible. For if *B* need not be possible, there is nothing to prevent its not being possible. Now let *A* be supposed possible. Then, when *A* is possible, nothing impossible would follow if *A* were supposed to be real; and then *B* must of course be real. But we supposed *B* to be impossible. [Let it be impossible, then. If, then, *B* is impossible, *A* also must be so. But *A* was supposed possible; therefore *B* also is possible.][4] If, then, *A* is possible, *B* also will be possible, if they were so related that if *A* is real, *B* must be real. If, then, *A* and *B* being thus related,[5] *B* is not possible on this condition,[6] *A* and *B* will not be related as was supposed.[7] And if when *A* is possible, *B* must be possible, then if *A* is real, *B* must also be real. For to say that *B* must be possible, if *A* is possible,

[1] Cf. 1047a 24–26.
[2] 1047b 3 read τὸ εἰρημένον τὸ δυνατόν.
[3] 1047b 15 read ὄντος εἶναι τοῦ *A*.
[4] 1047b 20 ἔστω—22 *B* ἄρα is probably spurious.
[5] Sc. so related that if the reality of *A* implies the reality of *B* the possibility of *A* implies the possibility of *B*.
[6] Sc. if *A* is possible.
[7] Sc. so related that the reality of *A* implies the reality of *B*.

means that if *A* is real both at the time when and in the way in which it was supposed capable of being real, *B* also must then and in that way be real.

CHAPTER V

As all potencies are either innate, like the senses, or come by practice, like the power of playing the flute, or by learning, like artistic potency, those which come by practice or by rational formula we must acquire by previous exercise, but this is not necessary with those which are not of this nature and which imply passivity.

Since that which is 'capable' is capable of something and at some time and in some way—with all the other qualifications which must be present in the definition—, and since some things can work according to a rational formula and their potencies involve a formula, while other things are non-rational and their potencies are non-rational, and the former potencies must be in a living thing, while the latter can be both in the living and in the lifeless; as regards potencies of the latter kind, when the agent and the patient meet in the way appropriate to the potency in question, the one must act and the other be acted on, but with the former kind of potency this is not necessary. For the non-rational potencies are all productive of one effect each, but the rational produce contrary effects, so that if they produced certain effects necessarily they would produce contrary effects at the same time; but this is impossible. That which decides, then, must be something else; I mean by this, desire or will. For whichever of two things the animal desires decisively, it will do, when it is in the circumstances appropriate to the potency in question and meets the passive object. Therefore everything which has a rational potency, when it desires that for which it has a potency and in the circumstances in which it has the potency, must do this. And it has the potency in question when the passive object is present and is in a certain state; if not it will not be able to act. To add the qualification 'if nothing external prevents it' is not further necessary; for it has the potency in so far as this is a potency of acting, and it is this not in all circumstances

but on certain conditions, among which will be the exclusion of external hindrances; for these are barred by some of the positive qualifications. And so even if one has a rational wish, or an appetite, to do two things or contrary things at the same time, one cannot do them; for it is not on these terms that one has the potency for them, nor is it a potency of doing both at the same time, since one will do just the things which it is a potency of doing.

CHAPTER VI

Since we have treated[1] of the kind of potency which is related to movement, let us discuss actuality, its genus and its differentia. In the course of our analysis it will also become clear, with regard to the potential, that we not only ascribe potency to that whose nature it is to move something else, or to be moved by something else, either without qualification or in some particular way, but also use the word in another sense, in the pursuit of which we have discussed these previous senses. Actuality means the existence of the thing, not in the way which we express by 'potentially'; we say that potentially, for instance, a statue of Hermes is in the block of wood and the half-line is in the whole, because it might be separated out, and we call even the man who is not studying a man of science, if he is capable of actually studying a particular problem.[2] Our meaning can be seen in the particular cases by induction, and we must not seek a definition of everything but be content to grasp the analogy,—that as that which is building is to that which is capable of building, so is 1048b
the waking to the sleeping, and that which is seeing to that which has its eyes shut but has sight, and that which is shaped out of the matter to the matter, and that which has been wrought up to the unwrought. Let actuality be defined by one member of this antithesis, and 'the potential' by the other. But all things are not said in the *same sense* to exist actually, but only by analogy—as A is in B or to B, C is in D or to D; for some are as movement to potency, and the others as determinate substance to some sort of matter.

[1] Cf. Θ. 1–5.

[2] 1048a 35 read τόδε.

The infinite and the void and all similar things are said to exist potentially and actually in a different sense from that in which many other things are said so to exist, e. g. that which sees or walks or is seen. For of the latter class these predicates can at some time be truly asserted without qualification; for the seen is so called sometimes because it is being seen, sometimes because it is capable of being seen. But the infinite does not exist potentially in the sense that it will ever actually have separate existence; its separateness is only in knowledge. For the fact that division never ceases to be possible gives the result that this actuality exists potentially, but not that it exists separately.

Since of the actions which have a limit none is an end but all are relative to the end, e. g. 'the process of making thin' is of this sort [1], and the things themselves when one is making them thin are in movement in this way (i. e. without being already that at which the movement aims), this is not an action or at least not a complete one (for it is not an end); but that in which the end is present is an action.[2] E. g. at the same time we are seeing and have seen, are understanding and have understood, are thinking and have thought: but it is not true that at the same time we are learning and have learnt, or are being cured and have been cured. At the same time we are living well and have lived well, and are happy and have been happy. If not, the process would have had sometime to cease, as the process of making thin ceases: but, as it is, it does not cease; we are living and have lived. Of these processes, then, we must call the one set movements, and the other actualities. For every movement is incomplete—making thin, learning, walking, building; these are movements,[3] and incomplete movements. For it is not true that at the same time we are walking and have walked, or are building and have built, or are coming to be and have come to be, or are being moved and have been moved, but if we are being moved and have been moved, what is moving us is different from what has

[1] 1048b 19 read *οἷον ἡ ἰσχνασία.* *ἰσχνασία* is presumably viewed as a means to health.

[2] 1048b 22 read *ἐκείνη ᾗ . . . καὶ πρᾶξις.*

[3] 1048b 30 read *αὗται δὴ κινήσεις.*

moved us. But it is the same thing that at the same time has seen and is seeing, or is thinking and has thought. The latter sort of process, then, I call an actuality, and the former a movement.

CHAPTER VII

The genus and the differentia of the actual may be taken as explained by these and similar considerations. But we must distinguish when a thing exists potentially and when it does not; for it is not at any and every time. E.g. is *earth* potentially a man? No—but rather when it has already become *seed*, 1049a
and perhaps not even then, as not everything[1] can be healed by the medical art or by luck, but there is a certain kind of thing which is capable of it, and only this is potentially healthy. And (1) the definition of that which as a result of *thought* comes to exist actually from having existed potentially is that when it has been willed it comes to pass if nothing external hinders it, while the condition on the other side—viz. in that which is healed—is that nothing in it hinders the result. Similarly there is potentially a house, if nothing in the thing acted on—i.e. in the matter—prevents it from becoming a house, and if there is nothing which must be added or taken away or changed; this is potentially a house, and the same is true of all other things for which the source of their becoming is external. And (2) in the cases in which the source of the becoming is in the very thing which suffers change, all those things are said to be potentially something else, which will be it of themselves if nothing external hinders them. E.g. the seed is not yet potentially a man; for it must further undergo a change in a foreign medium. But when through its own motive principle it has already got such and such attributes, in this state it is already potentially a man; while in the former state it needs another principle, just as earth is not yet potentially a statue, for it must change in order to become brass.[2]

It seems that when we call a thing not something else but

[1] 1049a 2 read ἴσως, ὥσπερ οὐδέ.

[2] The classes marked by (1) and (2) are the works of art and of nature respectively, but at the end (2) is illustrated by an example from (1).

N 2

'of' that something (e. g. a casket is not 'wood' but 'of wood', and wood is not 'earth' but 'made of earth', and again perhaps in the same way earth is not something else [1] but 'made of' that something), that something is always [2] potentially (in the full sense of that word) the thing which comes after it in this series. E.g. a casket is not 'earthen' nor 'earth', but 'wooden'; for wood is potentially a casket and is the matter of a casket, wood in general of a casket in general, and this particular wood of this particular casket. And if there is a first thing, which no longer is called after something else, and said to be 'of it', this is prime matter; e.g. if earth is 'airy' and air is 'fiery', but fire is not thus called after anything else, fire [3] is prime matter; while the ultimate substratum, if it is an individual, is not matter but substance. For the subject [4] or substratum is differentiated by being an individual or not being one; the substratum of *accidents* is an individual such as a man, i.e. body and soul, while the accident is something like 'musical' or 'white'. (The subject is called, when music is implanted in it, not 'music' but 'musical', and the man is not 'whiteness' but 'white', and not 'ambulation' or 'movement' but 'walking' or 'moving',—which is another instance of the derivative predicate.) Wherever this is so, then, the ultimate subject is a substance; but when this is not so but the predicate is a *form* or individual character, the ultimate subject is matter and material substance. And it is only right that the derivative term should
1049b be used with reference both to the matter and to the accidents; for both are indeterminates.[5] We have stated, then, when a thing is to be said to exist potentially and when it is not.

[1] 1049a 20 read *γῆ εἰ οὕτως μὴ ἄλλο.* [2] 1049a 21 read *ἀεὶ ἐκεῖνο.*
[3] 1049a 26 read *ἀὴρ πύρινος, τὸ δὲ πῦρ μὴ κατ' ἄλλος τὸ πῦρ.* So perhaps Alexander.
[4] 1049a 27 read *τὸ καθ' οὗ*, following O. Apelt. Cf. Γ. 1007a 34.
[4] Aristotle points out that there are two kinds of derivative predicates—those derived from the matter of the subject, like 'fiery', and those formed from the accidents of the subject, like 'musical'. Matter and accidents have this in common, that they are indeterminate—i. e. not confined to one special subject as essential predicates are. He mentions at the same time that there are two kinds of substratum—the bare matter which underlies form or essence, and the complete individual which underlies accidents. Cf. Z. 1038b 5.

CHAPTER VIII

We have distinguished[1] the various senses of 'prior', and it is clear that actuality is prior to potency. And I mean by potency not only that definite kind which is said to be a principle of change in another thing or in the thing itself regarded as other, but in general every principle of movement or of rest. For nature also is in the same genus as potency; for it is a principle of movement—not, however, in something else but in the thing itself *qua* itself. To all such potency, then, actuality is prior both in formula and in substance; and in time it is prior in one sense, and in another not.

(1) Clearly it is prior in formula; for that which is in the primary sense potential is potential because it is possible for it to become actual, e.g. I mean by 'capable of building' that which can build, and by 'capable of seeing' that which can see, and by 'visible' that which can be seen. And the same account applies to all other cases, so that the formula and the knowledge of the one must precede the knowledge of the other.

(2) In time it is prior in this sense: the actual member of a species is prior to the potential member of the same species, though the individual is potential before it is actual. I mean that the matter and the seed and that which is capable of seeing, which are potentially a man and corn and seeing, but not yet actually so, are prior in time to this particular man who now exists actually, and to the corn and to the seeing subject; but they are posterior in time to other actually existing things, from which they were produced. For from the potential the actual is always produced by an actual thing, e.g. man by man, musician by musician; there is always a first mover, and the mover already exists actually. We have said in our account of substance[2] that everything that is produced is something produced from something and by something, and that the same in species as it.

This is why it is thought impossible to be a builder if one has built nothing or a harper if one has never played the harp;

[1] Cf. Δ. 11.

[2] Cf. Z. 7, 8.

for he who learns to play the harp learns to play it by playing it, and all other learners do similarly. And thence arose the sophistical quibble, that one who does not know a science will be doing that which is the object of the science; for he who is learning it does not know it. But since, of that which is coming to be, some part must have come to be, and, of that which, in general, is changing, some part must have
1050a changed (this is shown in the treatise on movement [1]), he who is learning must, it would seem, know some part of the science. It is surely clear, then, in this way, that the actuality is in this sense also, viz. in order of becoming and of time, prior to the potency.

But (3) it is also prior in substantiality; firstly, because the things that are posterior in becoming are prior in form and in substantiality, e. g. man is prior to boy and human being to seed; for the one already has its form, and the other has not. Secondly, because everything that comes to be moves towards a principle, i. e. an end. For that for the sake of which a thing is, is its principle, and the becoming is for the sake of the end; and the actuality is the end, and it is for the sake of this that the potency is acquired. For animals do not see in order that they may have sight, but they have sight that they may see. And similarly men have the art of building that they may build, and theoretical science that they may theorize; but they do not theorize that they may have theoretical science, except those who are learning by practice; and these do not theorize except in a limited sense, or else they have no need to theorize.[2] Further, matter exists in a potential state, just because it may attain to its form; and when it exists *actually*, then it is in its form.

And the same holds good in cases in which the end is a movement, as well as in all others. Therefore as teachers think they have achieved their end when they have exhibited the pupil at work, so also does nature. For if this is not the case, we shall have Pauson's Hermes over again; for it will be hard to say about the knowledge, as about the

[1] Cf. *Phys.* vi. 6.

[2] 1050a 14 omit ὅτι. So perhaps Alexander. Sc. if they theorize in the full sense, they already have the ἕξις and do not need to theorize in order to obtain it.

statue, whether it is within or without.[1] For the action is the end, and the actuality is the action. Therefore even the *word* 'actuality' is derived from 'action', and points to the complete reality.

And while in some cases the exercise is the ultimate thing (e.g. in sight the ultimate thing is seeing, and no other product besides this results from sight), but from some things a product follows (e.g. from the art of building there results a house as well as the act of building), yet none the less the act is in the former case the end and in the latter more of an end than the mere potency is. For the act of building is in the thing that is being built, and comes to be—and is—at the same time as the house.

Where, then, the result is something apart from the exercise, the actuality is in the thing that is being made, e.g. the act of building is in the thing that is being built and that of weaving in the thing that is being woven, and similarly in all other cases, and in general the movement is in the thing that is being moved; but when there is no product apart from the actuality, the actuality is in the agents, e.g. the act of seeing is in the seeing subject and that of theorizing in the theorizing subject and the life is in the soul (and therefore well-being 1050b
also; for it is a certain kind of life).

Obviously, therefore, the substance or form is actuality.[2] From this argument it is obvious that actuality is prior in substantial being to potency; and as we have said,[3] one actuality always precedes another in time right back to the actuality of the eternal prime mover.

But actuality is prior in a higher sense also; for eternal things are prior in substance to perishable things, and no eternal thing exists potentially. The reason is this. Every potency is at one and the same time a potency of the opposite; for, while that which is not capable of being present in a sub-

[1] Alexander tells us that Pauson made a statue of Hermes, about which it was hard to say whether it was made in the ordinary way or enclosed in a transparent substance; how could it be 'without', when the surface looked smooth, or 'within', when the surface showed no trace of a joining?

[2] This follows from 1050a 16, and what intervenes is to some extent parenthetical.

[3] 1049b 17–29.

ject cannot be present, everything that is capable of being may possibly not be actual. That, then, which is capable of being may either be or not be; the same thing, then, is capable both of being and of not being. And that which is capable of not being may possibly not be; and that which may possibly not be is perishable, either in the full sense, or in the precise sense in which it is said that it possibly may not be, i. e. either in respect of place or quantity or quality; 'in the full sense' means 'in substance'. Nothing, then, which is in the full sense imperishable is in the full sense a potential being (though there is nothing to prevent its being so in some respect, e. g. potentially of a certain quality or in a certain place); imperishable things, then, exist actually. Nor can anything which is of *necessity* be potential; yet these things are primary; for if these did not exist, nothing would exist. Nor does eternal movement, if there be such, exist potentially; and, if there is an eternal *mobile*, it is not *potentially* in motion (except in respect of 'whence' and 'whither'; there is nothing to prevent its having matter which makes it capable of movement in various directions). Therefore the sun and the stars and the whole heaven are ever active, and there is no fear that they may sometime stand still, as the natural philosophers fear they may. Nor do they tire in this activity; for movement does not imply for them, as it does for perishable things, the potency of opposites, so that the continuity of the movement should be laborious; for it is that kind of substance which is matter and potency, not actuality, that causes this.

Imperishable things[1] are imitated by those that are involved in change, e. g. earth and fire. For these also are ever active; for they have their movement of themselves and in themselves.[2] But the other potencies, according to the distinction we have drawn above,[3] are all potencies of opposites; for that which can move another in this way can also move it not in this way, i. e. if it acts according to a rational formula. But the same *non-rational* potencies can produce opposite results only by their presence or absence.

If, then, there are any entities or substances such as the

[1] Sc. the heavenly bodies.
[2] i. e. they are both movers and moved.
[3] Cf. Θ. 2.

dialecticians say the Ideas are, there must be something much more scientific than the Idea of science and something more mobile than the Idea of movement; for these will be more of the nature of actualities, while the Ideas of science and movement are potencies of these.[1] Obviously, then, actuality is prior both to potency and to every principle of change.

CHAPTER IX

That the good actuality is better and more valuable than the good potency is evident from the following argument. Everything of which we say that it can do something, is alike capable of contraries, e.g. that of which we say that it can be well is the same as that which can be ill, and has both potencies at once; for one and the same potency is a potency of health and illness, of rest and motion, of building and throwing down, of being built and being thrown down. The capacity for contraries is present at the same time; but contraries cannot be present at the same time, and the actualities also cannot be present at the same time, e.g. health and illness. Therefore one of them must be the good, but the capacity is both the contraries alike, or neither; the actuality, then, is better. And in the case of bad things, the end or actuality must be worse than the potency; for that which 'can' is both contraries alike.

Clearly, then, the bad does not exist apart from bad things; for the bad is in its nature posterior to the potency.[2] And therefore we may also say that in the things which are from the beginning, i.e. in eternal things, there is nothing bad, nothing defective, nothing perverted (for perversion is something bad).

It is by actualization also that geometrical relations are discovered; for it is by dividing the given figures that people discover them. If they had been already divided, the relations would have been obvious; but as it is the divisions are present

[1] The Idea, being the universal apart from its special manifestations, will be a potentiality, and will therefore be inferior to the corresponding particulars—e.g. the Idea of science will be inferior to particular acts of scientific thought.

[2] Sc. while the eternal and substantial must be better than the potency.

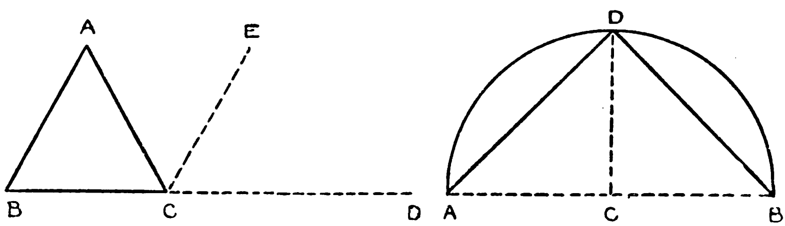
only potentially. Why are the angles of the triangle equal to two right angles? Because the angles about one point are equal to two right angles. If, then, the line parallel to the side had been already drawn, the theorem would have been evident to any one as soon as he saw the figure. Why is the angle in a semicircle in all cases a right angle? Because if three lines are equal—the two which form the base, and the perpendicular from the centre—the conclusion is evident at a glance to one who knows this premise.[1]

Obviously, therefore, the potentially existing relations are discovered by being reduced to actuality (the reason being that thinking is the actuality of thought[2]); so that potency is discovered from actuality (and therefore it is by an act of construction that people acquire the knowledge), though the single actuality is later in generation than the corresponding potency.

CHAPTER X

The terms 'being' and 'non-being' are employed firstly with reference to the categories, and secondly with reference to the potency or actuality of these or their non-potency or
1051b non-actuality, while being and non-being in the strictest sense

[1] The figures required for the two theorems are:—



Euclid gives a more direct proof by supposing D to be *any* point on the semicircle. But probably the symmetrical case in which CD is perpendicular to the diameter was what first suggested the theorem, and with Aristotle's construction the proof may be made quite general if we remember that all angles in the same segment are equal.

[2] The argument apparently is that, since thinking is an actuality, its object must be an actuality.

are truth and falsity[1]. The condition of this in the objects is their being combined or separated, so that he who thinks the separated to be separated and the combined to be combined has the truth, while he whose thought is in a state contrary to that of the objects is in error. This being so, when is what is called truth or falsity present, and when is it not? We must consider what we mean by these terms. It is not because we think truly that you are white, that you *are* white, but because you are white we who say this have the truth. If, then, some things are always combined and cannot be separated, and others are always separated and cannot be combined, while others are capable either of combination or of separation, 'being' is being combined and one, and 'not being' is being not combined but more than one; regarding contingent facts, then, the same opinion or the same statement comes to be false and true, and it is possible at one time to have the truth and at another to be in error; but regarding things that cannot be otherwise opinions are not at one time true and at another false, but the same opinions are always true or always false.

With regard to *incomposites*, what is 'being' or 'not being', and truth or falsity? A thing of this sort is not composite, so as to 'be' when it is compounded, and not to 'be' if it is separated, like 'the white wood' or 'the incommensurability of the diagonal'; nor will truth and falsity be still present in the same way as in the previous cases. In fact, as truth is not the same in these cases, so also 'being' is not the same; but (1) truth or falsity is as follows—contact and assertion are truth (assertion not being the same as affirmation), and ignorance is non-contact. I say 'ignorance', for it is not possible to be in *error* regarding the question what a thing is, save in an accidental sense; and the same holds good regarding non-composite substances (for it is not possible to be in error about them). And they all exist actually, not potentially; for otherwise they would come to be and cease to be; but, as it is, being

[1] The last clause is very difficult. The natural sense, which is given above, contradicts E. 1027b 31, and is not in keeping with Aristotle's usual doctrine. Yet we can hardly translate 'while sometimes they mean truth or falsity in the strictest sense', for there is no point here in a distinction between the strictest and other senses of 'truth'.

itself does not come to be (nor cease to be); for if it did it would have to come out of something. About the things, then, which are essences and exist in actuality, it is not possible to be in error, but only to think them or not to think them. Inquiry about their 'what'[1] takes the form of asking whether they are of such and such a nature or not.[2]

(2) As regards '*being*' in the sense of truth and 'not being' in the sense of falsity, in one case there is truth if the subject and the attribute are really combined, and falsity if they are not combined; in the other case, if the object is existent it
1052a exists in a particular way, and if it does not exist in this way it does not exist at all[3]; and truth means thinking these objects, and falsity does not exist, nor error, but only ignorance, —and not an ignorance which is like blindness; for blindness is akin to a total absence of the faculty of thinking.

It is evident also that about unchangeable things there can be no error in respect of time, if we assume them to be unchangeable. E.g. if we suppose that the triangle does not change, we shall not suppose that at one time its angles are equal to two right angles while at another time they are not (for that would imply change). It is possible, however, to suppose that one member of such a class has a certain attribute and another has not, e.g. while we *may* suppose that no even number is prime, we *may* suppose that some are and some are not. But regarding a single number not even this form of error is possible; for we cannot in this case suppose that one instance has an attribute and another has not; but whether our judgement be true or false, it is implied that the fact is eternal.

[1] 1051b 32 read τὸ τί ἐστι.
[2] Sc. not what elements their essence can be resolved into (for it is simple), but what other things it is like. Cf. H. 1043b 23–28.
[3] i.e. we have not here *A* and *B*, which may or may not be combined, but *A*, which if it exists at all exists as *A*. 1051b 35 read εἴπερ ὄν, οὕτως ἐστίν.

BOOK X (I)

CHAPTER I

WE have said[1] previously, in our distinction of the various meanings of words, that 'one' has several meanings; while it is used in many senses, the things that are primarily and of their own nature and not accidentally called one may be summarized under four heads. (1) There is the continuous, either in general, or especially that which is continuous by nature and not by contact nor by artificial union; and of these, those things have more unity and are prior, whose movement[2] is more indivisible and simpler. (2) That which is a whole and has a certain shape and form is *one* in a still higher degree; and especially if a thing is of this sort by nature, and not by force like the things which are unified by glue or nails or by being tied together, i.e. if it has in itself something which is the cause of its continuity. A thing is of this sort because its movement is one and indivisible in place and time; so that evidently if a thing has by nature a principle of movement that is of the first kind (i.e. local movement) and the first in that kind (i.e. circular movement), this is in the primary sense one extended thing. The things, then, which are in this way one are either continuous[3] or whole, and the other things that are one are those whose formula is one. Of this sort are the things the thought of which is one, i.e. those the thought of which is indivisible; and it is indivisible if the thing is indivisible in kind or in number. (3) In number, then, the individual is indivisible, and (4) in kind, that which in intelligibility and in knowledge is indivisible, so that that which causes substances to be one[4] must be one in the primary sense. 'One,' then,

[1] Δ. 6.

[2] Nature is defined (Δ. 1015^a 13) as 'the substantial being of the things which have a source of movement in themselves *qua* themselves'.

[3] 1052^a 29 read ἐν ᾗ συνεχές.

[4] Sc. the form.

has all these meanings—the naturally continuous, the whole, the individual, and the universal. And all these are one because in some cases the movement, in others the thought or the formula, is indivisible.

1052b But it must be observed that the questions, what sort of things are said to be one, and on the other hand what it is to be one and what is the formula of it, should not be assumed to be the same. 'One' has all these meanings, and each of those things to which one of these kinds of unity belongs will be one; but 'to be one' will sometimes mean being one of these things, and sometimes something else,[1] which is even nearer to the meaning of the *word* 'one', while these other things approximate to its *denotation*. This is also true of 'element' or 'cause', if one had both to specify the things of which it is predicable and to give the definition of the word. For in a sense fire is an element (and doubtless 'the indefinite' or something else of the sort is by its own nature the element), but in a sense it is not; for it is not the same thing to be fire and to be an element, but while as a particular thing with a nature of its own fire is an element, the name 'element' means that it has this attribute, that there is something which is made of it as a primary constituent. And so with 'cause' and 'one' and all such terms. For this reason 'to be one' means 'to be indivisible (being essentially a "this" and capable of existing apart) either in place, or in form or thought'; or perhaps 'to be whole and indivisible'; but it means especially 'to be the first measure of a kind', and above all of quantity; for it is from this that it has been extended to the other categories. For measure is that by which quantity is known; and quantity *qua* quantity is known either by a 'one' or by a number, and all number is known by a 'one'. Therefore all quantity *qua* quantity is known by the one, and that by which quantities are primarily known is the one itself; and so the one is the starting-point of number *qua* number. And hence in the other classes too 'measure' means that by which each is first known, and the measure of each is a unit—in length, in breadth,

[1] Cf. 1052b 18.

in depth, in weight, in speed. (The words 'weight' and 'speed' are common to both contraries[1]; for each of them has two meanings,—'weight' means both that which has any amount of gravity and that which has an excess of gravity, and 'speed' both that which has any amount of movement and that which has an excess of movement; for even the slow has a certain speed and the light a certain weight.)

In all these, then, the measure and starting-point is something one and indivisible, since even in lines we treat as indivisible the line a foot long. For everywhere we seek as the measure something one and indivisible; and this is that which is simple either in quality or in quantity. Now where it is thought impossible to take away or to add, there the measure is exact. Hence that of number is most exact; for we posit the unit as absolutely indivisible; and in all 1053a
other cases we imitate this sort of measure. For in the case of a furlong or a talent or of anything large any addition or subtraction might more easily escape our notice than in the case of something smaller; so that the first thing from which, as far as our perception goes, nothing can be subtracted, all men make the measure, whether of liquids or of solids, whether of weight or of size; and they think they know the quantity when they know it by means of this measure. And they know movement too by the simple movement and the quickest; for this occupies least time. And therefore in astronomy a 'one' of this sort is the starting-point and measure (for they assume the movement of the heavens to be uniform and the quickest, and judge the others by reference to it), and in music the quarter-tone (because it is the least interval) and in speech the letter. And all these are one in this sense —not that 'one' is something predicable in the same sense of all of these, but in the sense we have mentioned.

But the measure is not always one in number—sometimes there are several; e.g. the quarter-tones (not to the ear, but as determined by the ratios) are two, and the articulate sounds by which we measure are more than one, and the

[1] Sc. heavy and light, fast and slow.

diagonal of the square and its side are measured by two quantities, and so are all spatial magnitudes.[1] Thus, then, the one is the measure of all things, because we come to know the elements in the substance by dividing the things either in respect of quantity or in respect of kind. The one is indivisible just because the first of each class of things is indivisible. But it is not in the same way that every 'one' is indivisible, e.g. a foot and a unit; the latter is absolutely indivisible, while the former [2] is placed among things which are undivided in perception, as has been said already,[3]—only to perception, for doubtless every continuous thing is divisible.

The measure is always homogeneous with the thing measured; the measure of spatial magnitudes is a spatial magnitude, and in particular that of length is a length, that of breadth a breadth, that of articulate sounds an articulate sound, that of weight a weight, that of units a unit. (For we must state the matter so, and not say that the measure of numbers is a number; we ought indeed to say this if we were to use the corresponding form of words, but the supposition does not really correspond—it is as if one supposed that the measure of units is units, and not a unit, for number is a plurality of units.)

Knowledge also, and perception, we call the measure of things, for the same reason, because we know something by them,—while as a matter of fact they are measured rather than measure other things. But it is with us as if some one else measured us and we came to know how big we are by seeing that he applied the cubit-measure a certain number of times to us. But Protagoras says 'man' is the measure of all things, meaning really 'the man who knows' or 'the man
1053b who perceives', and these because they have respectively knowledge and perception, which we say are the measures

[1] Alexander thinks this means that a line may be measured either by the ideal measure (e.g. the standard yard), or by the particular imperfect measure (the yard-wand, which slightly differs from the standard yard). This sense does not agree with the context, and perhaps the meaning is that as the diagonal and the side are incommensurable they must be measured by different units. But what of 'all spatial magnitudes'?

[2] 1053a 23 read τὸ δ' εἰς ἀδιαίρετα πρὸς τὴν αἴσθησιν τίθεται.

[3] Cf. 1052b 33.

of objects. He is saying nothing, then, while he appears to be saying something remarkable.

Evidently, then, unity in the strictest sense, if we define it according to the meaning of the word, is a measure, and especially of quantity, and secondly of quality. And some things will be one if they are indivisible in quantity, and others if they are indivisible in quality; therefore that which is one is indivisible, either absolutely or *qua* one.

CHAPTER II

With regard to the substance and nature of the one we must ask in which of two ways it exists. This is the very question that we reviewed[1] in our discussion of problems, viz. what the one is and how we must conceive of it, whether we must take the one itself as being a substance (as both the Pythagoreans say in earlier and Plato in later times), or there is, rather, an underlying nature; and if so, how it is to be explained more intelligibly and more in the manner of the physical philosophers, of whom one says the one is love, another says it is air, and another the indefinite.[2]

If then no universal can be a substance, as has been said[3] in our discussion of substance and being, and if being itself cannot be a substance in the sense of a one apart from the many (for it is common to the many), but is only a predicate, clearly unity also cannot be a substance; for being and unity are the most universal of all predicates. Therefore, on the one hand, classes are not certain entities and substances separable from other things; and on the other hand the one cannot be a class, for the same reasons for which being and substance cannot be classes.

Further, this must hold good in all categories alike. Now 'being' and 'unity' have an equal number of meanings; so that since in the sphere of qualities the one is something definite—some entity—and similarly in the sphere of quantities, clearly

[1] B. 1001a 4–b25.
[2] The three thinkers referred to are Empedocles, Anaximenes, Anaximander.
[3] Z. 13.

we must also ask in general what unity is, as we must ask what being is, since it is not enough to say that its nature is just to be unity or being. But in colours the one is a colour, e.g. white, if the other colours are observed to be produced out of this and black, and if black is the privation of white, as darkness of light (for darkness is privation of light). Therefore if all existent things were colours, existent things would have been a number, indeed, but of what?[1] Clearly of colours; and the 'one' would have been a particular 'one', e.g. white. And similarly if all existent things were tunes, they would have been a number, but a number of quarter-tones, and their essence would not have been number; and the one would have been something whose substance was not to be
1054a one but to be the quarter-tone. And similarly if all existent things had been articulate sounds, they would have been a number of letters, and the one would have been a vowel. And if all existent things were rectilineal figures, they would have been a number of figures, and the one would have been the triangle. And the same argument applies to all other classes. Since, therefore, while there are numbers and a one both in affections and in qualities and in quantities and in movement, in all cases the number is a number of particular things and the one is one something, and its substance is not to be one, the same must be true of substances; for it is true of all cases alike. That the one, then, in every class is a definite thing, and in no case is its nature just this—viz. unity, is evident; but as in colours the one-itself which we must seek is one colour, so too in substance the one-itself is one substance.

And that in a sense unity means the same as being is clear from the fact that it follows being by having just as many meanings as there are categories, and is not comprised within any category, e.g. neither in substance nor in quality, but is related to them just as being is; and from the fact that in 'one man' nothing more is predicated than in 'man', just as being is nothing apart from substance or quality or quantity; and[2] to be one is just to be a particular thing.

[1] 1053b 33 read *ὄντα, ἀλλὰ τίνων;*
[2] 1054a 18 read *ποσόν· καὶ τὸ ἐνί.*

CHAPTER III

The one and the many are opposed in several ways, of which one is the opposition of the one and plurality as indivisible and divisible; for that which is either divided or divisible is called a plurality, and that which is indivisible or not divided is called one. Now since opposition is of four kinds, and one of these two terms is privative in meaning, they must be contraries, and neither contradictory nor correlative in meaning.[1] And the one gets its meaning and explanation from its contrary, the indivisible from the divisible, because plurality and the divisible is more perceptible than the indivisible, so that in formula plurality is prior to the indivisible, because of the conditions of perception. To the one belong, as we indicated graphically in our distinction of the contraries,[2] the same and the like and the equal, and to plurality belong the other and the unlike and the unequal.

'The same' has several meanings; (1) we sometimes mean 'the same numerically'; again, (2) we call a thing the same if it is one both in formula and in number, e.g. you are one with yourself both in form and in matter; and again, (3) if the formula of its primary essence is one; e.g. equal straight 1054b
lines are the same, and so are equal and equal-angled quadrilaterals; there are many such, but in these equality constitutes unity.

Things are like if, not being absolutely the same, nor without difference in their concrete substance, they are the same in form, e.g. the larger square is like the smaller, and unequal straight lines are like; they are like, but not absolutely the same. Other things are like, if, having the same form, and being things in which difference of degree is possible, they have no difference of degree. Other things, if they have a quality that is in form or kind one and the same —e.g. whiteness—in a greater or less degree, are called like because their form is one. Other things are called like if

[1] Two of the kinds, contrariety and privation, are not mutually exclusive, for contrariety is the relation between a form and its complete privation. Cf. Γ. 1004b 27, I. 1055b 26.

[2] Cf. Γ. 1004a 2.

the qualities they have in common are more numerous than those in which they differ—either the qualities in general or the prominent qualities, e. g. tin is like silver, *qua* white, and gold[1] is like fire, *qua* yellow and red.

Evidently, then, 'other' and 'unlike' also have several meanings. And the other in one sense is the opposite of the same (so that everything is either the same as or other than everything else). In another sense things are other unless both their matter and their formula are one (so that you are other than your neighbour). The other in the third sense is exemplified in the objects of mathematics.[2] 'Other' *or* 'the same' can be predicated of everything with regard to everything else,—but only if the things are one and existent, for the other is not the *contradictory* of the same; which is why it is not predicated of non-existent things (while 'not the same' *is* so predicated). It *is* predicated of all *existing* things; for if a thing is in its nature both existent and one, it is either one or not one with anything else. The other, then, and the same are thus opposed.

But difference is not the same as otherness. For the other and that which it is other than need not be other in some definite respect (for everything that exists is either other or the same), but that which is different from anything is different in some respect, so that there must be something identical whereby they differ. And this identical thing is genus or species; for all things that differ differ either in genus or in species,[3] in genus if the things have not their matter in common and are not generated out of each other (i. e. if they belong to different figures of predication),[4] and in species if they have the same genus ('genus' meaning that which is essentially predicated of both the different things alike). And contraries are different, and contrariety is a kind of difference. That we are right in this supposition is shown by induction. For they are all seen to be different; they are not merely[5] other, but some are other in genus, and others
1055a are in the same line of predication,[4] and therefore in the same

[1] 1054^b 12 read ἀργύρῳ ᾗ λευκόν, χρυσός. So perhaps Alexander.
[2] Cf. ^{a} 35–^{b} 3.
[3] See note on 1057^b 36.
[4] See note on A. 986^a 23.
[5] 1054^b 34 read φαίνεται καὶ οὐ μόνον.

genus, and the same in genus. We have distinguished[1] elsewhere what sort of things are the same or other in genus.

CHAPTER IV

Since things which differ may differ from one another more or less, there is also a greatest difference, and this I call contrariety. That contrariety is the greatest difference is made clear by induction. For things which differ in *genus* have no way to one another, but are too far distant and are not comparable; and for things that differ in *species* the extremes from which generation takes place are the contraries; and the distance between extremes—and therefore that between the contraries—is the greatest.

But that which is greatest in each class is complete. For that is greatest which cannot be exceeded, and that is complete beyond which nothing can be found. For the complete difference marks the end of a series (just as the other things which are called complete are so called because they have attained an end), and beyond the end there is nothing; for in everything it is the extreme and includes all else, and therefore there is nothing beyond the end, and the complete needs nothing further. From this, then, it is clear that contrariety is complete difference; and as contraries are so called in several senses, their modes of completeness will answer to the various modes of contrariety which attach to the contraries.

This being so, evidently one thing cannot have more than one contrary, for neither can there be anything more extreme than the extreme, nor can there be more than two extremes for the one interval. And in general if contrariety is a difference, and if a difference must be between two things, then the complete difference must be so too.

And the other commonly accepted definitions are also necessarily true of all contraries. For in each case the complete difference is the greatest difference. We cannot get anything beyond it, whether the things differ in genus or in species; for it has been shown[2] that there is *no* 'difference'

[1] Δ. 9.

[2] Cf. 1054^b 25–27. But how can we reconcile this with 1054^b 27–30, 35?

between anything and the things outside its *genus*; and (1) among the things which differ in *species* the complete difference is the greatest, and the things in the same genus which differ most are contraries; for the complete difference is the greatest difference between species of the same genus. And (2) the things in the same receptive material which differ most are contrary; for the matter is the same for contraries. And (3) of the things which are dealt with by the same faculty the most different are contrary; for one science deals with one class of things, and in these the complete difference is the greatest.

The primary contrariety is that between positive state and privation—not every privation, however (for 'privation' has several meanings), but that which is complete. And the other contraries must be called so with reference to these, some because they possess these, others because they produce or tend to produce them, others because they are acquisitions or losses of these or of other contraries. Now if the kinds of opposition are contradiction and privation and contrariety and
1055b relation, and of these the first is contradiction, and contradiction admits of no intermediate, while contraries admit of one, clearly contradiction and contrariety are not the same. But privation is a kind of contradiction; for what suffers privation, either in general or in some determinate way, is either that which is quite incapable of having some attribute or that which, being of such a nature as to have it, has it not; here we have already a variety of meanings, which have been distinguished[1] elsewhere. Privation, therefore, is a contradiction or incapacity which is determinate or taken along with the receptive material. This is the reason why, while contradiction does not admit of an intermediate, privation sometimes does; for everything is equal or not equal, but not everything is equal or unequal, or if it is, it is only within the sphere of that which is receptive of equality. If, then, the changes which happen to the matter start from the contraries, and proceed either from the form and the possession of the form or from a privation of the form or shape, clearly all contrariety is a privation. But certainly not all privation is contrariety, the reason being that that which suffers privation

[1] Δ. 22.

may suffer it in several ways. It is only the *extremes* from which changes proceed that are contraries.

And this is obvious also by induction. For every contrariety involves, as one[1] of its terms, a privation. But not all cases are alike; inequality is the privation of equality and unlikeness of likeness, and on the other hand vice is the privation of virtue. But the cases differ as has been said[2]; in one case we mean simply that the thing suffers privation, in another case that it does so at a certain time or in a certain part (e. g. at a certain age or in the proper part), or throughout. This is why in some cases there is a mean (there are men who are neither good nor bad), and in others there is not (a number must be either odd or even). Further, some contraries have their subject defined, others have not.—Therefore it is evident that one of the contraries is always privative; but it is enough if this is true of the first—i. e. the generic—contraries, e. g. the one and the many; for the others can be reduced to these.

CHAPTER V

Since one thing has one contrary, we might raise the question how the one is opposed to the many and the equal to the great and the small.—For if[3] we use the word 'whether' only in an *antithesis*, e.g. 'whether is it white or black?', and 'whether is it white or not white?' (we do not say 'whether is it a man or white?' unless we are proceeding on a prior assumption and asking something analogous to this, 'whether was it Cleon or Socrates that came?' But this is not a *necessary* disjunction in any class of things. Yet even this is an extension from the case of opposites; for opposites alone cannot be present together; and we assume this incompatibility here in asking which of
the two came; for if they might both have come, the question 1056a
would have been absurd. But if they might, even so this falls just as much into an antithesis—that of the one and the many, i.e. 'whether did both come or one of the two?'):—if, then, the question 'whether' is always concerned with opposites, and

[1] 1055b 18 read *θάτερον*.
[2] 1055b 4.
[3] 1055b 32 read *εἰ γὰρ τὸ πότερον*.

we can say 'whether is it greater or less or equal?' what is the opposition between the greater and the less, and the equal? The equal is not contrary either to one alone or to both; for why should it be contrary to the greater rather than to the less? Further, the equal is contrary to the *unequal*. Therefore if it is contrary to the greater and the less, it will be contrary to more things than one. But if the unequal means the same as both the greater and the less together, the equal *will* be opposite to both (and the difficulty supports those who say the unequal is a 'two' [1]), but it follows that one thing has two contraries, which is impossible. Again, the equal is evidently intermediate between the great and the small, but no contrary is either observed to be intermediate, nor, from its definition, can be so; for it would not be a perfect contrary if it were intermediate between any two things, but rather it always has something intermediate between itself and something else.

It remains, then, that it is opposed either as negation or as privation. It cannot be opposite to one of the two; for why to the great rather than to the small? It is then the privative negation of both. Therefore also 'whether' is said with reference to both—not to one of the two (e.g. 'whether is it greater or equal?' or 'whether is it equal or less?'); there are always three cases. But it is not a *necessary* privation; for not everything which is not greater or less is equal, but only the things which are of such a nature as to have these attributes. The equal, then, is that which is neither great nor small and is naturally fitted to be either great or small; and it is opposed to both as a privative negation (and therefore is also intermediate). And that which is neither good nor bad is opposed to both, but has no name (for each of these has several meanings and the receptive material is not one); but that which is neither white nor black has more claim to a name. Yet even this has not one name, though the colours of which this negation is privatively predicated are in a way limited; for they must be either grey or yellow or something else of the kind. Therefore it is an incorrect criticism that is passed by those who think that all such phrases are used in the same

[1] This is a Platonic doctrine; cf. N. 1087ᵇ 10.

way, so that that which is neither a shoe nor a hand would be intermediate between a shoe and a hand, since that which is neither good nor bad is intermediate between the good and the bad,—as if there must be an intermediate in all cases. This result does not necessarily follow. For the combined denial of opposites applies when there is an intermediate and a certain natural interval; but in the other case there is no 'difference'[1]; for the things, the denials of which are 1056b
combined, belong to different classes, so that the substratum is not one.

CHAPTER VI

We might raise similar questions about the one and the many. For if the many are absolutely opposed to the one, certain impossible results follow. One will then be few[2]; for the many are opposed also to the few. Further, two will be many, since the double is multiple, and 'double' derives its meaning from 'two'; therefore one will be few; for what is that in comparison with which two are called many, except one, which must therefore be few? For there is nothing fewer. Further, if the much[3] and the little are in plurality what the long and the short are in length, and whatever is much is also many, and the many are much (unless, indeed, there is a difference in the case of an easily-bounded continuum)[4], the little (or few) will be a plurality. Therefore one is a plurality, if it is few; and this must be so, if two are many. But perhaps, while the 'many' is in a sense said to be 'much', it is with a difference, e.g. water is much but not many.

But 'many' is applied to the things that are divisible; in one sense it means a plurality which is excessive either absolutely or relatively (while 'few' is similarly a plurality which is de-

[1] Cf. 1054b 25–27.

[2] The Greek is ὀλίγον ἢ ὀλίγα, which, it might seem, should be translated 'a little or a few'. But the singular ὀλίγον is used only because of the difficulty of predicating the plural ὀλίγα of 'one'. On the other hand, πολύ and πολλά are used in the really distinct senses of 'much' and 'many'. ὀλίγον has been translated 'few' in this chapter except where it is opposed to πολύ and must be translated 'little'.

[3] 1056b 10 read ἔτι εἰ ὡς.

[4] i.e. a fluid. Cf. I. 16.

ficient), and in another sense it means number, in which sense alone it is opposed to the one. For we say 'one or many', just as if one were to say 'one and ones' or 'white thing and white things', or to compare the things that have been measured with the measure.[1] It is in this sense also that multiples are so called. For each number is said to be many because it consists of ones and because each number is measurable by one; and it is 'many' as that which is opposed to one, not to the few. *In this sense*, then, even two is many—not however in the sense of a plurality which is excessive either relatively or absolutely; it is the *first* plurality. But *without qualification* two is few; for it is the first plurality which is deficient. For this reason Anaxagoras was not right in leaving the subject with the statement[2] that all things were together, boundless both in multitude and in smallness—where by 'and in smallness' he meant 'and in fewness'; for they could not have been boundless in fewness, since it is not one, as some say, but two, that make a few.

The one is opposed then to the many in numbers as measure to thing measurable; and these are opposed as relatives which are not from their very nature relative. We have distinguished[3] elsewhere the two senses in which relatives are so called:—(1) as contraries; (2) as knowledge to thing known, a term 1057a being called relative because another is relative to it. There is nothing to prevent one from being fewer than something, e.g. than two; for if it is fewer, it is not therefore few. Plurality is as it were the class to which number belongs; for number is plurality measurable by one. And one and number are in a sense opposed, not as contrary, but as we have said some relative terms are opposed; for inasmuch as one is measure and the other measurable, they are opposed. This is why not everything that is one is a number, i.e. if the thing is indivisible it is not a number. But though knowledge is similarly spoken of as related to the knowable, the relation does not work out similarly, for while knowledge might be thought to be the measure, and the knowable the thing measured, the fact is that all knowledge is knowable, but not all that is know-

[1] 1056b 22 omit καὶ τὸ μετρητόν.   [2] Fr. 1, Diels, *Vorsokratiker*.
[3] Δ. 1021a 26.

able is knowledge, because in a sense knowledge is measured by the knowable.—Plurality is contrary neither to the few (the *many* being contrary to this as excessive plurality to plurality exceeded), nor to the one in every sense; but in one sense they are contrary, as has been said, because the former is divisible and the latter indivisible, while in another sense they are relative (as knowledge is to knowable), if plurality is number and the one is measure.

CHAPTER VII

Since contraries admit of an intermediate and in some cases have it, the intermediate must be composed of the contraries. For (1) all intermediates are in the same genus as the things between which they stand. For we call those things intermediates, into which that which changes must change first; e. g. if we were to pass from the highest string to the lowest by the shortest way, we should come sooner to the intermediate notes, and in colours if we are to pass from white to black, we shall come sooner to crimson and gray than to black; and similarly in all other cases. But to pass from one genus to another genus (e. g. from colour to figure) is not possible except in an incidental way. Intermediates, then, must be in the same genus as one another and as the things they stand between.

But (2) all intermediates stand between opposites of some kind; for only between these can change take place in virtue of their own nature. Therefore an intermediate is impossible between things which are not opposite; for then there would be change which was not from one opposite towards the other. Among opposites, contradictories admit of no middle term; for contradiction is this—an opposition, one or other side of which must attach to anything whatever, i. e. which has no intermediate. Of other opposites, some are relative, others privative, others contrary. Of relative terms, those which are not contrary have no intermediate. The reason is that they are not in the same genus. For what intermediate could there be between knowledge and knowable? But between great and 1057b
small there *is* one.

(3) If intermediates are in the same genus, as has been shown, and stand between contraries, they must be composed of these contraries. For either there will be a genus including the contraries or there will be none. And if (*a*) there is a genus in such a way that it is something prior to the contraries, the differentiae which constitute the contrary species of the genus will be contraries prior to the species; for species are composed of the genus and the differentiae. E. g. if white and black are contraries, and one is a piercing colour and the other a compressing colour,[1] these differentiae—'piercing' and 'compressing'—are prior; so that these are prior contraries of one another (though indeed the species which differ by contrariety are more truly contrary[2]). And the other species, i. e. the intermediates, must be composed of their genus and their differentiae. E. g. all colours which are between white and black must be said to be composed of the genus (i. e. colour) and certain differentiae. But these differentiae will not be the primary contraries; otherwise every colour would be either white or black. They are different, then, from the primary contraries; and therefore they will be between the primary contraries; the primary differentiae are 'piercing' and 'compressing'. Therefore it is (*b*) with regard to these contraries which do not fall within a genus that we must first ask of what their intermediates are composed. (For things which *are* in the same genus must be composed of terms in which the genus is not an element, or else be themselves incomposite.[3]) Now contraries do not involve one another in their composition, and are therefore first principles; but the

[1] Cf. Pl. *Tim.* 67 E ff.

[2] This very difficult clause seems to mean that the species are more properly contraries than the differentiae. Of the differentiae one is obviously just the negation of the other, and they might be regarded as ἕξις and στέρησις; but each of the species has a positive nature of its own, and is a true ἐναντίον.

[3] Aristotle has first (εἰ μέν, l. 4) considered the case of contraries in a genus, and shown that they involve prior contraries which are not in the genus, but when added to the genus constitute its species. These are the primary contraries, and it is primarily of them that we must ask, Of what are their intermediates composed? The sentence, ll. 20–22, in which he reverts to contraries in a genus must be parenthetical. A species in a genus must either contain an element (sc. the differentia) which does not itself contain the genus, or (which is incompatible with its being a species) be an unanalysable term.

intermediates are either all incomposite, or none of them. But there is something compounded out of the contraries, which is such that there can be a change from a contrary to it sooner than to the other contrary; for it will have less of the quality in question than the one contrary and more than the other. This also,[1] then, will come between the contraries. All the other intermediates also, therefore, are *composite*; for that which has more of a quality than one thing and less than another is compounded somehow out of the things than which it is said to have more and less respectively of the quality. And since there are no other things prior to the contraries and homogeneous with the intermediates, all intermediates must be compounded *out of the contraries*. Therefore all the inferior classes, both the contraries and their intermediates, will be compounded out of the primary contraries.[2] Clearly, then, intermediates are (1) all in the same genus and (2) intermediate between contraries and (3) compounded out of the contraries.

CHAPTER VIII

That which is other in species is other than something in something, and this must belong to both[3]; e.g. if it is an animal other in species, both are animals. The things, then, which are other in species must be in the same genus. For by genus I mean that one identical thing which is predicated of

[1] i.e. this intermediate differentia comes between the extreme differentiae, as the intermediate species comes between the extreme species.

[2] This *seems* to mean that each extreme as well as each intermediate species is compounded out of both the extreme differentiae. E.g. white would have to be to some extent 'compressing' as well as 'piercing'. But this is not in itself a likely doctrine, and it can hardly be said to be proved in the present passage; the meaning probably is that each extreme species contains *one* differentia as a logical element, the other element being the genus; while each intermediate contains both the differentiae.

[3] It might seem that the respect in which things differ is just what does not belong to both. But Aristotle's meaning is this: If *A* differs from *B*, it must be a different something, and this something is the genus common to both. Horse and man are different *animals*. And when two things differ in their essence, they differ just in that in which (in another sense of 'in') they agree. Difference in a genus makes the genus itself other (1058a 7-8). Cf. 1054b 25-28.

both and is differentiated in no merely accidental way, whether conceived as matter or otherwise. For not only must the common nature attach to the different things, e.g. not only must both be animals, but this very animality must also be different for each (e.g. in the one case equinity, in the other humanity), and therefore this common nature is specifically different for the two things. One then will be in virtue of its own nature one sort of animal, and the other another, e.g. one a horse and the other a man. This difference then must be an otherness of the genus. For I give the name of 'difference in the genus' to an otherness which makes the genus itself other.

This, then, will be a contrariety (as can be shown also by induction). For all things are divided by opposites, and it has been proved that contraries are in the same genus [1]. For contrariety was seen [2] to be complete difference; and every difference in species is a difference from something *in something*; so that this is the same for both and is their genus. (Hence also all contraries which are different in species and not in genus are in the same line of predication,[3] and other than one another in the highest degree—for the difference is complete—, and cannot be present along with one another.) The difference, then, is a contrariety.

This, then, is the meaning of calling two things other in species—that they are contrary, being in the same genus and being indivisible [4] (and those things are the same in species, which have no contrariety, being indivisible [5]); we say 'being indivisible', for in the process of division contrarieties arise even in the intermediate stages before we come to the indivisibles.[4] Evidently, therefore, with reference to that which is called the genus, none of the species which belong to [6] the genus is either the same as it or other than it in species (for the matter is indicated by negation,[7] and the genus is the matter of that of which it is called the genus, not in the sense in which we speak of the genus or family of the Heraclidae, but in that in

[1] Ch. iv.
[2] 1055^{a} 16.
[3] Cf. 1054^{b} 35 and note on A. 986^{a} 23.
[4] Sc. *infimae species*.
[5] Sc. individuals.
[6] 1058^{a} 23 read προσηκόντων.
[7] i. e. by eliminating the form which characterizes the concrete thing.

which we speak of a genus in nature[1]), nor is it so with reference to things which are not in the same genus, but it will differ in *genus* from them, and in species from things in the same genus. For the difference between things which differ in species must be a contrariety; and this belongs only to things in the same genus.

CHAPTER IX

One might raise the question, why woman does not differ from man in species, female and male being contrary, and their difference being a contrariety; and why a female and a male animal are not different in species, though this difference belongs to animal in virtue of its own nature, and not as whiteness or blackness does; both 'female' and 'male' belong to it *qua* animal. This question is almost the same as the other, why one contrariety makes things different in species and another does not, e.g. 'with feet' and 'with wings' do, but whiteness and blackness do not. Perhaps it is because the former are modifications peculiar to the genus, and the latter are less so. And since one element is formula and one is matter, contrarieties which are in the formula make a difference in 1058b
species, but those which are in the concrete material thing do not make one. Therefore whiteness in a man, or blackness, does not make one, nor is there a difference in species between the white man and the black man, not even if each of them be denoted by one word. For 'man' plays the part of matter, and matter does not create a difference; for it does not make individual men species of man, though the flesh and the bones of which this man and that man consist are other. The concrete thing is other, but not other in species, because in the formula there is no contrariety, and man is the ultimate indivisible kind. Callias is formula + *matter*; 'white man', then, is so also, because it is the individual Callias that is white; 'man', then, is white only incidentally. Nor do a brazen and a[2] wooden circle differ in species; and if a brazen triangle and a wooden circle differ in species, it is not because of the

[1] Cf. Δ. 28.

[2] 1058b 13 read καὶ ξύλινος, οὐδέ.

matter, but because there is a contrariety in the formula. But does the matter not make things other in species, when it is other in a certain way, or is there a sense in which it does? For why is this horse other than this man in species, although their matter is included with their formulae? Doubtless because there is a contrariety in the *formula*. For while there is a contrariety also between white man and black horse, and it is a contrariety in species, it does not depend on the whiteness of the one and the blackness of the other, since even if both had been white, yet they would have been other in species. And male and female are indeed modifications peculiar to 'animal', not however in virtue of its essence but in the matter, i. e. the body. This is why the same seed becomes female or male by being acted on in a certain way. We have stated, then, what it is to be other in species, and why some things differ in species and others do not.

CHAPTER X

Since contraries are other in form, and the perishable and the imperishable are contraries (for privation is a determinate incapacity[1]), the perishable and the imperishable must be different in kind.[2]

Now so far we have spoken of the general terms themselves, so that it might be thought not to be necessary that every imperishable thing should be different from every perishable thing in form, just as not every white thing is different in form from every black thing. For the same thing can be both, even at the same time if it is a universal (e.g. man can be both white and black), and if it is an individual it can

[1] 1058b 27 read ἀδυναμία διωρισμένη.

[2] To translate γένος and εἶδος as 'genus' and 'species' makes nonsense of the argument of this chapter. They have therefore been rendered 'kind' and 'form'. The only trace of the technical distinction is found in the last sentence of the chapter, and there it is not justified by what precedes. It looks as if the first part of the chapter had been written before the distinction was drawn, and ll. 10–14 (or perhaps only l. 14) added under the supposition that a *generic* difference between the perishable and the imperishable had been proved. For the absence of distinction between γένος and εἶδος cf. 1071a 25 with 27, *Cat.* 8b 27 with 9a 14, *Hist. An.* i. 490b 16 with 17, *Pol.* iv. 1290b 33 with 36. To read εἴδει in 1058b 28 is useless in view of 1059a 10–14.

still be both; for the same man can be, though not at the same time, white and black. Yet white is contrary to black.

But while some contraries belong to certain things by accident (e.g. those now mentioned and many others), others cannot, and among these are both 'perishable' and 'imperishable'. For nothing is by accident perishable. What is acci- 1059a
dental is capable of not being present, but perishableness is one of the attributes that belong of necessity to the things to which they belong; or else one and the same thing may be perishable and imperishable, if perishableness is capable of not belonging to it. Perishableness then must either be the essence or be present in the essence of each perishable thing. The same account holds good for imperishableness also; for both are attributes which are present of necessity. The characteristics, then, in respect of which and in direct consequence of which one thing is perishable and another imperishable, are opposite, so that the things must be different in kind.

Evidently, then, there cannot be Forms such as some maintain, for then one man[1] would be perishable and another[2] imperishable. Yet the Forms are said to be the same in form with the individuals and not merely to have the same name; but things which differ in kind[3] are further apart than those which differ in form.

[1] The sensible individual.
[2] The ideal man.
[3] As the perishable and the imperishable have been shown to do.

BOOK XI (K)

CHAPTER I

THAT Wisdom is a science of first principles, is evident from the introductory chapters[1] in which we have raised objections to the statements of others about the first principles; but one might ask the question whether Wisdom is to be conceived as one science or as several. If as one, it may be objected that one science always deals with contraries, but the first principles are not contrary. If it is not one, what are these sciences with which it is to be identified?[2]

Further, is it the business of one science or of more to examine the first principles of demonstration? If of one, why of this rather than of any other? If of more, which must these be said to be?[3]

Further, does philosophy investigate all substances or not? If not all, it is hard to say which; but if, being one, it investigates them all, it is doubtful how the same science can embrace several subject-matters.[4]

Further, does it deal with substances only or also with their accidents? If in the case of attributes demonstration is possible, in that of substances it is not. But if the two sciences are different, what is each of them and which is Wisdom? If we think of it as demonstrative, the science of the *accidents* is Wisdom, but if as dealing with first principles, the science of *substances* claims the title.[5]

But again the science we are looking for must not be supposed to deal with the causes which have been mentioned in the *Physics*.[6] For (1) it does not deal[7] with the final cause (for this is the good, and this is found in the field of action and movement; and it is the first mover—for that

[1] Cf. Bk. A.

[2] Cf. B. 996ª 18–ᵇ 26.

[3] Cf. B. 996ᵇ 26–997ª 15.

[4] Cf. B. 997ª 15–25.

[5] 1059ª 32 read ᾗ μὲν γὰρ ἀποδεικτική, σοφία ἡ περὶ τὰ συμβεβηκότα, ᾗ δὲ περὶ τὰ πρῶτα, ἡ τῶν οὐσιῶν. Cf. B. 997ª 25–34.

[6] The material, formal, efficient, and final causes (*Phys.* ii. 3).

[7] 1059ª 35 read οὔτε.

is the nature of the end—but in the case of things unmovable there is no first mover),[1] and (2) in general it is hard to say whether the science we are now looking for deals with perceptible substances or not with them, but with certain 1059^{b} others. If (*a*) with others, it must deal either with the Forms or with the objects of mathematics. Now (i) evidently the Forms do not exist. (But it is hard to say, even if one suppose them to exist, why the same is not true of the other things of which there are Forms, as of the objects of mathematics. I mean that the Platonists place the objects of mathematics between the Forms and perceptible things, as a third class of things besides the Forms and the things in this world; but there is not a third man or horse besides the ideal and the individuals. If on the other hand it is not as they say, with what sort of things must the mathematician be supposed to deal? Certainly not with the things in this world; for none of these is the sort of thing which the mathematical sciences inquire into.) Nor (ii) does the science which we are now seeking treat of the objects of mathematics; for none of them can exist separately. But again (*b*) it does not deal with perceptible substances; for they are perishable.

In general we might raise the question, to which science it belongs to discuss the difficulties about the matter of the objects of mathematics. Neither to physics (because the whole inquiry of the physicist is about the things that have in themselves a principle of movement and rest), nor yet to the science which inquires into demonstration and science; for *this* is just the subject which *it* investigates. It remains then that it is the philosophy which we have set before ourselves that treats of those subjects.[2]

One might discuss the question whether the science we are seeking should be said to deal with the principles which are by some called elements. All men suppose these to be present in *concrete* things; but it might be thought that the science we seek should treat rather of *universals*; for every formula and every science is of universals and not of *infimae species*,[3] so that as far as this goes it would deal with the highest classes. These would be being and unity;

[1] Cf. B. 996^{a} 21–^{b} 1. [2] Cf. B. 997^{a} 34–998^{a} 19. [3] Cf. B. 998^{b} 15.

for these might most of all be supposed to contain all things that are, and to be most like principles because they are first by nature; for if they perish all other things are destroyed with them; for all things *are* and are one. But inasmuch as, if one is to suppose them to be genera, they must be genera predicable of their differentiae, and no genus is predicable of any of its differentiae, in this way it would seem that we should not make them genera nor principles. Further, if the simpler is more of a principle than the less simple, and the ultimate members of the genus are simpler than the genus (for they are indivisible, but the genera are divided into many and differing species), the species might seem to be the principles, rather than the genera. But inasmuch as the species are involved in the destruction of the genera, the genera are more like principles; for that which involves
1060a another in its destruction is a principle of it.[1] These and others of the kind are the subjects that involve difficulties.

CHAPTER II

Further, must we suppose something apart from indvidual things, or is it these that the science we are seeking treats of? The objection to the latter view is that the individuals are infinite in number.[2] But the things that are apart from the individuals are genera or species; and the science we now seek treats of neither of these. The reason why this is impossible has been stated.[3] It is in general hard to say whether one must assume that there is a separable substance besides the sensible substances (i.e. the substances in this world), or that these are the real things and philosophy is concerned with them. For we seem to seek another kind of substance, and this is our problem, i.e. to see if there is something which can exist apart by itself and belongs to no sensible thing.—Further, if there is another substance apart from and corresponding to sensible substances, which kinds of sensible substance must be supposed to have this corresponding to them? Why should one suppose men or horses to have it,

[1] Cf. B. 998a 20–999a 23.
[2] 1060a 4 Alexander reads φθαρτά for ἄπειρα, and this may be right.
[3] 1059b 21–1060a 1.

and not the other animals or even all lifeless things? On the other hand to set up other and eternal substances equal in number to the sensible and perishable substances would seem to fall beyond the bounds of probability.—But if the principle we now seek is not separable from corporeal things, what has a better claim to the name than matter? This, however, does not exist in actuality, but exists in potency, and it would seem rather that the form or shape is a more important principle than this; but the form is perishable,[1] so that there is no eternal substance at all which can exist apart and independent. But this is paradoxical; for such a principle and substance seems to exist and is sought by nearly all the best thinkers as something that exists; for how is there to be order unless there is something eternal and independent and permanent?[2]

Further, if there is a substance or principle of such a nature as that which we are now seeking, and if this is one for all things, and the same for eternal and for perishable things, it is hard to say why, if there is the same principle, some of the things that fall under the principle are eternal, and others are not eternal; this is paradoxical. But if there is one principle of perishable and another of eternal things, we shall be in a like difficulty if the principle of perishable things, as well as that of eternal, is eternal; for why, if the principle is eternal, are not the things that fall under the principle also eternal? But if it is perishable it must have another principle, and that must have yet another, and this will go on to infinity.[3]

If on the other hand we set up what are thought to be the most unchangeable principles, being and unity, firstly, if each of these does not indicate a 'this' and a substance, how 1060b will they be separable and independent? Yet we expect the eternal and primary principles to be so. But if each of them does signify a 'this' and a substance, all things that are are substances; for being is predicated of all things (and unity also of some); but that all things that are are substance is false. Further, how can they be right who say that the first principle

[1] It must be remembered that A. is only stating common opinions and the consequent difficulties.

[2] Cf. B. 999a 24–b 24.

[3] Cf. B. 1000a 5–1001a 3.

is unity and this is substance, and generate number as the first product from unity and from matter, and assert that number is substance? How are we to think of 'two', and each of the other numbers composed of units, as one? On this point neither do they say anything nor is it easy to say anything. But if we suppose lines or what comes after these (I mean the primary plane figures) to be principles, these at least are not separable substances, but sections and divisions—the former of surfaces, the latter of solids (while points are sections and divisions of lines); and further they are limits of these same things; and all these are in other things and none is separable. Further, how are we to suppose that there is a substance of unity and the point? Every substance comes into being by a gradual process, but the point does not; for the point is a division.[1]

A further difficulty is raised by the fact that all knowledge is of universals and of the 'such', but substance does not belong to universals, but is rather a 'this'—a separable thing, so that if there is knowledge about the first principles, the question arises, how are we to suppose the first principle to be substance?[2]

Further, is there anything apart from the concrete thing (by which I mean the matter and that which is joined with matter), or not? If not, we are met by the objection that all things that are in matter are perishable. But if there *is* something, it must be the form or shape. It is hard to determine in which cases this exists apart and in which it does not; for in some cases the form is evidently not separable, e. g. in the case of a house.[3]

Further, are the principles the same in kind or in number? If in number, all things will be the same.[4]

CHAPTER III

Since the science of the philosopher treats of being *qua* being universally and not of some part of it, and 'being' has

[1] Cf. B. 1001ᵃ 4–1002ᵇ 11.
[2] Cf. B. 1003ᵃ 5–17.
[3] Cf. B. 999ᵇ 15–20, 1002ᵇ 12–32.
[4] Cf. B. 999ᵇ 24–1000ᵃ 4.

many senses and is not used in one only, it follows that if it is used equivocally and in virtue of no common nature, it does not fall under one science (for there is no one class in the case of equivocal terms); but if it is used in virtue of some common nature, it will fall under one science. The term seems to be used in the way we have mentioned, like 'medical' and 'healthy'. For each of these also we use in many senses; and each is used in this way because the former refers somehow to medical science and the latter to health. Other terms refer to other central concepts, but each term refers to one identical concept. For a prescription and a knife are called medical because the former proceeds from medical science, and the latter is useful to it. And a thing is called healthy in the same way; one thing because it is indicative of health, another because it is productive of it. And the same is true in the other cases. Everything that is, then, is said to 'be' in this same way; each thing is said to 'be' because it is a modification of being *qua* being or a permanent or a transient state or a movement of it, or something else of the sort. And since everything that is may be referred to some one common nature, each of the contrarieties also may be referred to the first differences and contrarieties of being, whether the first differences of being are plurality and unity or likeness and unlikeness, or some other differences; let these be taken as already discussed. It makes no difference whether that which is be referred to being or to unity. For even if they are not the same but different, they are convertible; for that which is one is also somehow being, and that which is being is one.—But as every pair of contraries falls to be examined by one and the same science, and in each pair one term is the privation of the other (though one might regarding some contraries raise the question, how they can be privatively related, viz. those which have an intermediate, e.g. unjust and just; in all such cases one must maintain that the privation is not of the whole definition, but of its extreme form; e.g. if the just man is 'by virtue of some permanent disposition obedient to the laws', the unjust man need not have the whole definition denied of him, but will be 'in some respect deficient in obedience to the laws', and in this respect the privation will

attach to him; and similarly in all other cases); and since, as the mathematician investigates abstractions (for in his investigation he eliminates all the sensible qualities, e.g. weight and lightness, hardness and its contrary, and also heat and cold and the other sensible contrarieties, and leaves only the quantitative and continuous, sometimes in one, sometimes in two, sometimes in three dimensions, and the attributes of things *qua* quantitative and continuous, and does not consider them in any other respect, and examines the relative positions of some and the consequences of these, and the commensur-
1061b ability and incommensurability of others, and the ratios of others; but yet we say there is one and the same science of all these things—geometry), the same is true with regard to being (for the attributes of this in so far as it is being, and the contrarieties in it *qua* being, it is the business of no other science than *philosophy* to investigate; for to *physics* one would assign the study of things not *qua* being, but rather *qua* sharing in movement; while *dialectic* and *sophistic* deal with the attributes of things that are, but not of things *qua* being, and not with being itself in so far as it is being);—therefore it remains that the *philosopher* studies the things we have named, in so far as they are being. Since all that is is said to 'be' in virtue of one common character though the term has many meanings, and contraries are in the same case (for they are referred to the first contrarieties and differences of being), and things of this sort can fall under one science, the difficulty we stated at the beginning[1] is solved,—I mean the question how there can be one science of things which are many and different in genus.

CHAPTER IV

Since even the mathematician uses the common axioms only in a special application, it must be the business of first philosophy to examine the principles of mathematics also. That when equals are taken from equals the remainders are equal, is common to all quantities, but mathematics marks off a part

[1] 1059a 20-23. Cf. Γ. 1, 2. The question raised in 1059a 29-34 has also incidentally been answered.

of its proper matter and studies it separately, e.g. lines or angles or numbers or some other kind of quantity—not, however, *qua* being but in so far as each of them is continuous in one or two or three dimensions; but philosophy does not inquire about particular subjects in so far as each of them has such and such attributes, but considers each subject in relation to being *qua* being.—Physics is in the same position as mathematics; for physics studies the attributes and the principles of the things that are, *qua* moving and not *qua* being, whereas the primary science, we have said, deals with these, only in so far as the underlying subjects are existent, and not in virtue of any other character. Therefore both physics and mathematics must be regarded as *parts* of Wisdom.[1]

CHAPTER V

There is a principle in things, about which we cannot be deceived, but must always, on the contrary, recognize the truth, —viz. that the same thing cannot at one and the same time be and not be, or admit any other similar pair of opposites. About 1062a such matters there is no proof in the full sense, though there is proof *ad hominem*. For it is not possible to infer this truth itself from a more certain principle, yet this is necessary if there is to be proof of it in the full sense.[2] But he who wants to prove to the asserter of opposites that he is wrong must get from him an admission which shall *be* identical with the principle that the same thing cannot both be and not be at one and the same time, but shall not *seem* to be identical: for thus alone can he demonstrate his thesis to the man who says that opposite statements can be truly made about the same subject. Those, then, who are to join in argument with one another must to some extent understand one another; for if this does not happen how *can* they join in argument with one another? Therefore every word must be intelligible and signify something, and not many things but only one; and if it signifies more than one thing, it must be made plain to which of these the word is being applied. He, then, who says this 'is'

[1] Cf. Γ. 1005a 19–b 5, K. 1059a 23–26.
[2] Cf. Γ. 1006a 5–18.

and 'is not' denies what he affirms, so that what the word signifies, he says it does not signify; and this is impossible. Therefore if 'this is' signifies something, one cannot truly assert the contradictory predicate of the same subject.[1]

Further, if the word signifies something and this can be truly asserted of it, this connexion must be necessary; and it is not possible that that which is necessary should ever not be; it is not possible therefore to make the opposed assertions truly of the same subject.[2] Further, if the affirmation is no more true than the negation, he who says 'man' will be no more right than he who says 'not-man'. It would seem also that in saying the man is not a horse we should be either more or not less right than in saying he is not a man, so that (on the view we are opposing) we shall be right in saying that the same person *is* a horse; for it was assumed to be possible to make opposite statements equally truly. It follows then that the same person is a man and a horse, or any other animal.[3] While, then, there is no proof of the axiom in the full sense, there is a proof which may suffice for one who will make these suppositions. And perhaps if we had questioned Heraclitus himself in this way we might have forced him to confess that opposite statements can never be true of the same subjects. But, as it is, he adopted his opinion without understanding what his statement involved.[4] But in any case if what is said
1062^{b} by him is true, not even this itself is true—viz. that the same thing can at one and the same time both be and not be. For as, when the statements are separated, the affirmation is no more true than the negation, in the same way—the complex statement being like one affirmation—its negation will be no less[5] true than the whole taken as an affirmation.[6] Further, if it is not possible to affirm anything truly, this itself will be false—the assertion that there is no true affirmation. But if a true affirmation exists, this appears to refute what is said by those who raise such objections and utterly destroy rational discourse.[7]

[1] Cf. Γ. 1006^{a} 18–1007^{a}20.
[2] Cf. Γ. 1006^{b} 28–34.
[3] Cf. Γ. 1007^{b} 18–1008^{a} 2.
[4] Cf. Γ. 1005^{b} 23–26.
[5] 1062^{b} 6 read *οὐδὲν ἧττον ἡ ἀπόφασις.*
[6] Cf. Γ. 1008^{a} 4–7.
[7] Cf. Γ. 1012^{b} 13–18.

CHAPTER VI

The saying of Protagoras is like the views we have mentioned; he said that man is the measure of all things, meaning simply that that which seems to each man assuredly is. If this is so, it follows that the same thing both is and is not, and is bad and good, and that the contents of all other opposite statements are true, because often a particular thing appears beautiful to some and ugly to others, and that which appears to each man is the measure. This difficulty may be solved by considering the source of the opinion. It seems to have arisen in some cases from the doctrine of the natural philosophers, and in others from the fact that all men have not the same views about the same things, but a particular thing appears pleasant to some and the contrary of pleasant to others.[1]

That nothing comes to be out of that which is not, but everything out of that which is, is a doctrine common to nearly all the natural philosophers. Since, then, a thing can become not-white, having been perfectly white and in no respect not-white, that which becomes not-white must come from that which is not not-white[2]; so that a thing must come to be out of that which is not (so they argue), unless the same thing was at the beginning both not-white and white. But it is not hard to solve this difficulty; for we have said in our works on physics[3] in what sense things that come to be come to be from that which is not, and in what sense from that which is.[4]

But to lend oneself equally to the opinions and the fancies of disputing parties is foolish; for clearly one of them must be mistaken. And this is evident from what happens in sensation; for the same thing never appears sweet to some and bitter to others, unless in the one case the sense-organ which 1063a
discriminates the aforesaid flavours has been perverted and injured. And if this is so the one party must be taken to be the measure, and the other must not. And I say the same of good and bad, and beautiful and ugly, and all other such qualities. For to maintain the view we are opposing is just like

[1] Cf. Γ. 1009a 6–16, 22–30. [2] 1062b 28 read ἐκ μὴ ὄντος μὴ λευκοῦ.
[3] *Phys.* i. 8, *De Gen. et Corr.* i. 317b 14. [4] Cf. Γ. 1009a 30–36.

maintaining the truth of what appears to people who put their finger under their eye and make the object appear two instead of one, i. e. like saying that it is two (because it appears to be of that number) and again one (for to those who do not interfere with their eye the one object appears one).[1]

In general, it is absurd to make the fact that the things of this earth are observed to change and never to remain in the same state, the basis of our judgements about the truth. For in pursuing the truth one must start from the things that are always in the same state and suffer no change. Such are the heavenly bodies; for these do not appear to be now of one nature and again of another, but are manifestly always the same and share in no change.[2]

Further, if there is movement, and something moved, and everything is moved out of something and into something, it follows that that which is moved must first be in that out of which it is to be moved, and then not be in it, and move into the other and come to be in it; but it follows that the contradictory statements are not true *at the same time*, as our opponents assert they are.[3]

And if the things of this earth continuously flow and move in respect of quantity—if one were to suppose this, although it is not true—why should they not endure in respect of quality? For the assertion of contradictory statements about the same thing seems to have arisen largely from the belief that the quantity of bodies does not endure, which, our opponents hold, justifies them in saying that the same thing both is and is not four cubits long. But the essence depends on quality, and this is of determinate nature, though quantity is indeterminate.[4]

Further, when the doctor orders people to take some particular food, why do they take it? It is hard to see in what respect 'this is bread' is truer than 'this is not bread'; so that it would make no difference whether one ate or not. But as a matter of fact they take the food which is offered, assuming that they know the truth about it and that it is

[1] Cf. Γ. 1010^b 1–26, 1011^a 31–^{b} 1.
[2] Cf. Γ. 1010^a 25–32.
[3] 1063^a 21 read *αὐτούς*. Cf. Γ. 1010^a 35–^{b} 1.
[4] Cf. Γ. 1010^a 22–25.

bread. Yet they should not, if there were no fixed constant nature in sensible things, but all moved and flowed for ever.[1]

Again, if we are always changing and never remain the same, what wonder is it if to us, as to the sick, things never appear the same? For to them also, because they are not in 1063b
the same condition as when they were well, sensible qualities do not appear alike; yet, for all that, the sensible things themselves need not share in any change, though they produce different, and not identical, sensations in the sick. And the same must surely happen to the healthy if the aforesaid[2] change takes place. But if we do not change but remain the same, there will be something that endures.[3]

As for those to whom these difficulties are suggested by the supposed necessity of a reason for everything, it is not easy to solve the difficulties to their satisfaction, unless they will posit something and no longer demand a reason for it; for it is only thus that all reasoning and all proof is accomplished; if they posit nothing, they destroy discussion and all reasoning. Therefore with such men there is no reasoning. But as for those who are perplexed by the traditional difficulties, it is easy to meet them and to dissipate the causes of their perplexity. This is evident from what has been said.

It is manifest, therefore, from these arguments that contradictory statements cannot be truly made about the same subject at one time,[4] nor can contrary statements, because every contrariety depends on privation. This is evident if we reduce the formulae of contraries to their principle.[5]

Similarly, no intermediate between contraries can be predicated of one and the same subject, of which one of the contraries is predicated. If the subject is white we shall be wrong in saying it is neither white nor black, for it would follow that it is and is not white; for the first of the two terms we have put together[6] would be true of it, and this is the contradictory of white.[7]

We could not be right, then, in accepting the views either of Heraclitus or of Anaxagoras. If we were, it would follow

1 Cf. Γ. 1008b 12–27.
2 Cf. 1063a 35.
3 Cf. Γ. 1009a 38–b 33.
4 Cf. Γ. 1009a 16–22, 1011a 3–16.
5 Cf. Γ. 1011b 15–22.
6 Sc. 'not white' and 'not black'.
7 Cf. Γ. 7.

that contraries would be predicated of the same subject, for when Anaxagoras says a part of everything is in everything, he says nothing is sweet any more than it is bitter, and so with any other pair of contraries, since in everything everything is present not potentially only, but actually and separately. And similarly all statements cannot be false nor all true, both because of many other difficulties which might be deduced as arising from this position, and because if all are false it will not be true even to say all are false, and if all are true it will not be false to say all are false.[1]

CHAPTER VII

Every science seeks certain principles and causes for each of
1064a its objects—e. g. medicine and gymnastics and each of the other sciences, whether productive or mathematical. For each of these marks off a certain class of things for itself and busies itself about this as about something existing and real,—not however *qua* real; the science that does *this* is another distinct from these. Of the sciences mentioned each gets somehow the 'what' in some class of things and tries to prove the other truths, whether loosely or accurately. Some get the 'what' through perception, others by hypothesis; so that it is clear from an induction of this sort that there is no *demonstration* of the substance, i. e. of the 'what'.

There is a science of nature, and evidently it must be different both from practical and from productive science. For in the case of productive science the principle of production is in the producer and not in the product, and is either an art or some other potency. And similarly in practical science the movement is not in the thing done, but rather in the doers. But the science of the natural philosopher deals with the things that have *in themselves* a principle of movement. It is clear from these facts, then, that natural science must be neither practical nor productive, but theoretical (for it must fall into one of these classes). And since each of the sciences must somehow know the 'what' and use this as a principle, we must not fail to observe how the natural philosopher should define things and how he must state the formula

[1] Cf. Γ. 8.

of the essence—whether as akin to 'snub' or rather to 'concave'. For of these the formula of the 'snub' includes the matter of the thing, but that of the 'concave' is independent of the matter; for 'snubness' is found in a nose, so that we look for its formula without eliminating the nose, for the 'snub' is a concave nose. Evidently then the formula of flesh and the eye and the other parts must always be stated without eliminating the matter.

Since there is a science of being *qua* being and capable of existing apart, we must consider whether this is to be regarded as the same as physics or rather as different. Physics deals with the things that have a principle of movement in themselves; mathematics is theoretical, and *is* a science that deals with things that are at rest, but its subjects cannot exist apart. Therefore about that which can exist apart and is unmovable there is a science different from both of these, if there *is* a substance of this nature (I mean separable and unmovable), as we shall try to prove there is.[1] And if there is such a kind of thing in the world, here must surely be the divine, and this must be the first and most important principle. Evidently, 1064b
then, there are three kinds of theoretical sciences—physics, mathematics, theology. The class of theoretical sciences is the best, and of these themselves the last named is best; for it deals with the highest of existing things, and each science is called better or worse in virtue of its proper object.

One might raise the question whether the science of being *qua* being is to be regarded as universal or not. Each of the mathematical sciences deals with some one determinate class of things, but universal mathematics applies alike to all. Now if natural substances are the first of existing things, physics must be the first of sciences; but if there is another entity and substance, separable and unmovable, the knowledge of it must be different and prior to physics and universal because it is prior.[2]

CHAPTER VIII

Since 'being' in general has several senses, of which one is 'being by accident', we must consider first that which is in

[1] Cf. Λ. 6, 7. [2] Cf. E. 1, K. 1059a 26–29.

this sense. Evidently none of the traditional sciences busies itself about the accidental. For neither does architecture consider what will happen to those who are to use the house (e. g. whether they will have a painful life in it or not), nor does weaving, or shoemaking, or the confectioner's art, do the like; but each of these sciences considers only what is peculiar to it, i. e. its proper end. And as for the question whether the musical is also lettered, or[1] the argument that 'when he who is musical becomes lettered he will be both at once, not having been both before; and that which is, not having always been, must have been coming to be; therefore he must have been at once becoming musical and lettered',—this none of the recognized sciences considers, but only sophistic; for this alone busies itself about the accidental, so that Plato was not wrong when he said[2] that the sophist spends his time on non-being.

That a science of the accidental is not even possible, will be evident if we try to see what the accidental really is. We say that everything either is always and of necessity (necessity not in the sense of violence, but that which we appeal to in demonstrations), or is for the most part, or is neither for the most part, nor always and of necessity, but merely as it chances; e. g. there might be cold in the dog-days, but this occurs neither always and of necessity, nor for the most part, 1065a though it might happen sometimes. The accidental, then, is what occurs, but not always nor of necessity, nor for the most part. Now we have said what the accidental is, and it is obvious why there is no science of such a thing; for all science is of that which is always or for the most part, but the accidental is in neither of these classes.

Evidently there are not causes and principles of the accidental, of the same kind as there are of the essential; for if there were, everything would be of necessity. If *A* is when *B* is, and *B* is when *C* is, and if *C* exists not by chance but of necessity, that of which *C* was cause will exist of necessity, down to the last *causatum* as it is called (but this was supposed to be accidental). Therefore all things will be of

[1] 1064b 23 read οὐδ' εἰ τὸ μουσικὸν καὶ γραμματικόν, οὐδέ, following A. Bullinger. Cf. E. 1026b 16.

[2] Cf. *Sophistes* 237 A, 254 A.

necessity, and chance and the possibility of a thing's either occurring or not occurring are removed entirely from the range of events. And if the cause be supposed not to exist but to be coming to be, the same results will follow; everything will occur of necessity. For to-morrow's eclipse will occur if *A* occurs, and *A* if *B* occurs, and *B* if *C* occurs; and in this way if we subtract time from the limited time between now and to-morrow we shall come sometime to the already existing condition. Therefore since this exists, everything after this will occur of necessity, so that all things occur of necessity.

As to that which 'is' in the sense of being true or of being by accident, the *former* depends on a combination in thought and is an affection of thought (which is the reason why it is the principles, not of that which 'is' in this sense, but of that which is outside and can exist apart, that are sought); and the *latter* is not necessary but indeterminate (I mean the accidental); and of such a thing the causes are unordered and indefinite.[1]

Adaptation to an end is found in events that happen by nature or as the result of thought. It is 'luck' when one of these events[2] happens by accident. For as a thing may exist, so it may be a cause, either by its own nature or by accident.[3] Luck is a cause accidentally effecting such events adapted to an end as are usually effected by will. Therefore luck and thought are concerned with the same sphere; for will cannot exist without thought. The causes from which lucky results might happen are indeterminate; therefore luck is obscure to human calculation and is a cause by accident, but in the unqualified sense a cause of nothing.[4] It is good or bad luck when the result is good or evil; and prosperity or misfortune when the scale is large.[5]

Since nothing accidental is prior to the essential, neither 1065^{b}
are accidental causes prior. If, then, luck or spontaneity is a cause of the material universe, reason and nature are causes before it.[6]

[1] Cf. E. 2–4.

[2] Sc. which happen *usually* by nature or as the result of thought.

[3] Cf. *Phys.* ii. 196^{b} 21–25.

[4] Cf. *Phys.* ii. 197^{a} 5–14.

[5] Cf. *Phys.* ii. 197^{a} 25–27.

[6] Cf. *Phys.* ii. 198^{a} 5–13.

CHAPTER IX

Some things exist only actually, some potentially, some potentially and actually; one is a 'this', another a quantity, another falls in one of the other categories.[1] There is no movement apart from things; for change is always according to the categories of being; and there is nothing common to these and in no one category; but each of the categories belongs to all its subjects in either of two ways (e. g. 'this-ness'—for one kind of it is 'positive form', and the other is 'privation'; and as regards quality one kind is 'white' and the other 'black', and as regards quantity one kind is 'complete' and the other 'incomplete', and as regards spatial movement one is 'upwards' and the other 'downwards', or one thing is 'light' and another 'heavy'); so that there are as many kinds of movement and change as of being. Each kind of thing being divided into the potential and the completely real, I call the actuality of the potential as such, movement. That what we say is true, is plain from the following facts. When the 'buildable', in so far as it is what we mean by 'buildable',[2] exists actually, it is being built, and this is the process of building. Similarly with learning, healing, and rolling, walking, leaping, ageing, ripening.[3] Movement takes place when the complete reality itself exists, and neither earlier nor later.[4] The complete reality, then, of that which exists potentially, when it is completely real and actual, not *qua* itself, but *qua* movable, is movement. By *qua* I mean this: bronze is potentially a statue; but yet the complete reality of bronze, *qua* bronze, is not movement. For it is not the same to be bronze and to be a certain potency. If it were absolutely the same in its definitory formula, the complete reality of bronze would have been a movement. But it is not the same.[5] This is evident in the case of contraries; for to be capable of health and to be capable of illness are not the same; for if

[1] Cf. *Phys.* iii. 200b 26–28.

[2] i. e. not as so much matter, but as matter capable of being made into a building.

[3] Cf. *Phys.* iii. 200b 32–201a 19.

[4] Cf. *Phys.* iii. 201b 6, 7.

[5] 1065b 28 perhaps we should read τοῦτο, 'but its complete reality is not movement.'

they were, health and illness would have been the same. (It is that which underlies and is healthy or sick, whether it is moisture or blood, that is one and the same.) And since they are not the same, as colour and the visible are not the same, it is the complete reality of the potential *as such*, that is movement. Evidently it is this, and movement takes place when this[1] complete reality exists, and neither earlier nor later. For 1066a
each thing is capable of being sometimes actual, sometimes not, e.g. the 'buildable' *qua* 'buildable'; and the actuality of the 'buildable' *qua* 'buildable' is building. For the actuality is either this—building—or the house. But when the *house* exists, it is no longer 'buildable'; the 'buildable' is what *is being* built. The actuality then must be the *building*,[2] and the building is a movement. And the same account applies to all other movements.

That what we have said is right, is evident from what all others say about movement, and from the fact that it is not easy to define it otherwise. For firstly one cannot put it in another class. This is evident from what people say. Some call it difference and inequality and the unreal; none of these, however, is necessarily moved, and further, change is not to these nor from these but rather from opposite to opposite. The reason why people put movement in these classes is that it is thought to be something indefinite, and the principles on one side of the 'list of contraries'[3] are indefinite because they are privative, for none of them is either a 'this' or a 'such' or in any of the other categories. And the reason why movement is thought to be indefinite is that it cannot be classed either with the potency of things or with their actuality, for neither that which is capable of being of a certain quantity, nor that which is actually of a certain quantity, is moved of necessity. And movement is thought to be an actuality, but incomplete; the reason is that the potential, whose actuality it is, is incomplete. And therefore it is hard to grasp what movement is; for it must be classed either

[1] 1065b 35 read *αὕτη*.
[2] The argument is that the *house* cannot be the *ἐνέργεια* of the buildable, for when the house exists the buildable has ceased to exist; therefore its *ἐνέργεια* must be the *process of building*.
[3] Cf. note on A. 986a 23.

with privation or with potency or with absolute actuality, but evidently none of these is possible. Therefore what remains is that it must be what we said—actuality and not actuality, in the sense we have defined—which is hard to understand but capable of existing.[1]

And evidently movement is in the movable; for it is the complete realization of this by that which is capable of causing movement. And the actuality of that which is capable of causing movement is no other than that of the movable. For it must be the complete reality of both. For a thing is capable of causing movement because it *can* do this, and is a mover because it is *active*; but it is on the movable that it is capable of acting, so that the actuality of both alike is one, just as there is the same interval from one to two as from two to one, and as the steep ascent and the steep descent are one, but the being of them is not one; the case of the mover and the moved is similar.[2]

CHAPTER X

The infinite is either that which is incapable of being traversed because it is not its nature to be traversed (this corresponds to the sense in which the voice is 'invisible'), or that which admits only of incomplete traverse or scarcely admits of traverse, or that which, though it naturally admits of traverse, is not traversed or limited; further, a thing may be infinite in respect of addition or of subtraction or of both.
1066b The infinite cannot be a separate, independent thing. For if it is neither a spatial magnitude nor a plurality, but infinity itself is its substance and not an accident, it will be indivisible; for the divisible is either magnitude or plurality. But if indivisible, it is not infinite, except as the voice is invisible; but people do not mean this, nor are we examining this sort of infinite, but the infinite as untraversable.[3] Further, how can an infinite exist by itself, unless number and magnitude also exist by themselves,—since infinity is an attribute of these?[4] Further, if the infinite is an accident of something else, it cannot be *qua* infinite an element in things, as the

[1] With 1065b 22–1066a 27 cf. *Phys.* iii. 201a 27–202a 3.
[2] Cf. *Phys.* iii. 202a 13–21.
[3] Cf. *Phys.* iii. 204a 3–14.
[4] Cf. *Phys.* iii. 204a 17–19.

invisible is not an element in speech, though the voice is invisible.[1] And evidently the infinite cannot exist actually. For then any part of it that might be taken would be infinite; for 'to be infinite' and 'the infinite' are the same, if the infinite is substance and not predicated of a subject. Therefore it is either indivisible, or if it is secable, it is divisible into ever divisible parts; but the same thing cannot be many infinites, yet as a part of air is air, so a part of the infinite would be infinite, if the infinite is a substance and a principle. Therefore it must be insecable and indivisible. But the actually infinite cannot be indivisible; for it must be a quantity. Therefore infinity belongs to a subject incidentally. But if so, as we have said, it cannot be it that is a principle, but rather that of which it is an accident—the air or the even number.[2]

This inquiry is universal; but that the infinite is not *among sensible things*, is evident from the following argument. If the definition of a body is 'that which is bounded by planes', there cannot be an infinite body either sensible or intelligible; nor a separate and infinite number, for number or that which has a number can be completely enumerated.[3] The truth is evident from the following concrete argument. The infinite can neither be composite nor simple. For (1) it cannot be a composite body, since the elements are limited in multitude. For the contraries must be equal and no *one* of them must be infinite; for if one of the two bodies falls at all short of the other in potency, the finite will be destroyed by the infinite. And that *each* should be infinite is impossible. For body is that which has extension in all directions, and the infinite is the boundlessly extended, so that the infinite body will be infinite in every direction. Nor (2) can the infinite body be one and simple—neither, as some say, something which is apart from the elements, from which they generate these[4] (for there is no such body apart from the elements; for everything can be resolved into that of which it consists, but no such product of analysis is observed except the simple bodies), nor fire nor any other of the elements. For apart from the 1067a

[1] Cf. *Phys.* iii. 204a 14–17.
[2] Cf. *Phys.* iii. 204a 20–32.
[3] Cf. *Phys.* iii. 204a 34–b 8.
[4] Cf. *Phys.* iii. 204b 10–24.

question how any of them could be infinite, the All, even if it is finite, cannot either be or become one of them, as Heraclitus says[1] all things sometime become fire. The same argument applies to the One, which the natural philosophers posit besides the elements. For everything changes from the contrary, e. g. from hot to cold.[2]

Further, every sensible body is somewhere, and whole and part have the same proper place, e. g. the whole earth and part of the earth. Therefore if (1) the infinite body is homogeneous, it will be unmovable or it will be always moving. But the latter is impossible; for why should it rather move down than up or anywhere else? E. g. if there is a clod which is part of an infinite body, where will this move or rest? The proper place of the body which is homogeneous with it is infinite. Will the clod occupy the whole place, then? And how? ⟨This is impossible.⟩ What then is its rest or its movement?[3] It will either rest everywhere, and then it cannot move; or it will move everywhere, and then it cannot be still. But (2) if the infinite body has unlike parts, the proper places of the parts are unlike also, and, firstly, the body of the All is not one except by contact, and, secondly, the parts will be either finite or infinite in variety of kind. *Finite* they cannot be; for then those of one kind will be infinite in quantity and those of another will not (if the All is infinite), e. g. fire or water would be infinite, but such an infinite part would be destruction to its contrary.[4] But if the parts are *infinite* and simple, their places also are infinite and the elements will be infinite; and if this is impossible, and the places are finite, the All also must be limited.[5]

In general, there cannot be an infinite body and also a

[1] Fr. 30, 31, Diels, *Vorsokratiker*.

[2] Cf. *Phys.* iii. 204^b 32–205^a 7.

[3] 1067^a 13 read ἡ μονὴ καὶ ἡ κίνησις.

[4] Cf. *Phys.* iii. 205^a 10–25. Cf. 1066^b 28–34, from which it appears that the argument is as follows. If a finite number of kinds is to make an infinite whole, at least one kind must be infinite in extent. They cannot all be infinite, for they limit one another. But if one is infinite and another finite, the former destroys the latter and there ceases to be the variety of kinds within the whole which is at present presupposed. Aristotle omits to mention that the supposition of a finite kind co-existing with an infinite kind is in itself absurd, because the finite limits the infinite. But this would only make his case stronger.

[5] Cf. *Phys.* iii. 205^a 29–32.

proper place for all bodies, if every sensible body has either weight or lightness. For it must move either towards the middle or upwards, and the infinite—either the whole or the half—cannot do either; for how will you divide it? Or how will part of the infinite be up and part down, or part extreme and part middle? Further, every sensible body is in a place, and there are six kinds of place,[1] but these cannot exist in an infinite body. In general, if there cannot be an infinite place, there cannot be an infinite body; ⟨and there cannot be an infinite place,⟩ for that which is in a place is somewhere, and this means either up or down or in one of the other directions, and each of these is a limit.[2]

The infinite is not the same in the sense that it is one thing whether exhibited in distance or in movement or in time, but the posterior among these is called infinite in virtue of its relation to the prior, i. e. a movement is called infinite in virtue of the distance covered by the spatial movement or alteration or growth, and a time is called infinite because of the movement which occupies it.[3]

CHAPTER XI

Of things which change, some change in an accidental sense, 1067b
like that in which 'the musical' may be said to walk, and others are said, without qualification, to change, because something in them changes, i. e. the things that change in parts; the body becomes healthy, because the eye does. But there is something which is by its own nature moved primarily, and this is the essentially movable. The same distinction is found in the case of the mover; for it causes movement either in an accidental sense or in respect of a part of itself or essentially. There is something that primarily causes movement; and there is something that is moved, also the time in which it[4] is moved, and that from which and that into which it is moved.[5] But the forms and the affections and the place, which are the terminals of the movement of moving things, are unmovable, e. g. knowledge or heat; it is

[1] Sc. up and down, right and left, before and behind.

[2] Cf. *Phys.* iii. 205b 24–206a 7.

[3] Cf. *Phys.* iii. 207b 21–25.

[4] 1067b 8 read ἔτι ἐν ᾧ χρόνῳ.

[5] Cf. *Phys.* v. 224a 21–35.

not heat that is a movement, but heating.[1] Change which is not accidental is found not in all things, but between contraries, and their intermediates, and between contradictories. We may convince ourselves of this by induction.[2]

That which changes changes either from positive into positive, or from negative into negative, or from positive into negative, or from negative into positive. (By positive I mean that which is expressed by an affirmative term.) Therefore there must be three changes; for that from negative into negative is not change; for the terms are neither contraries nor contradictories, because there is no opposition. The change from the negative into the positive which is its contradictory is generation—absolute change absolute generation, and partial change partial generation; and the change from positive to negative is destruction—absolute change absolute destruction, and partial change partial destruction. If, then, 'that which is not' has several senses,[3] and movement can attach neither to that which implies putting together or separating,[4] nor to that which implies potency and is opposed to that which is in the full sense[5] (true, the not-white or not-good *can* be moved *incidentally*, for the not-white might be a man; but that which is not a particular thing at all can in no wise be moved), that which is not cannot be moved, and if this is so, generation cannot be movement; for that which is not *is* generated. For even if we admit to the fullest that its generation is accidental, yet it is true to say that 'not-being' is predicable of that which is generated absolutely.[6] (Similarly *rest* cannot belong to that which is not.) These difficulties, then, follow, and also this, that everything that is moved is in a place, but that which is not is not in a place; for then it would be somewhere. Nor is destruction movement; for the contrary

[1] Cf. *Phys.* v. 224b 11–16.
[2] Cf. *Phys.* v. 224b 28–30.
[3] Cf. E. 1026a 33–b 2, 1027b 18–19.
[4] i. e. to 'that which is not' in the sense of 'the judgement which is false'.
[5] i. e. a thing cannot be moved when it does not exist actually, but exists potentially.
[6] i. e. even if the not-being (privation) which is the starting-point of generation can exist only as an accident of prime matter, still not-being *is* the starting-point of absolute generation (i. e. generation of a substance, not of a quality).

of movement is movement or rest, but the contrary of destruction is generation. Since every movement is a change, 1068a
and the kinds of change are the three named above, and of these those in the way of generation and destruction are not movements, and these are the changes from a thing to its contradictory, only the change from positive into positive can be movement. And the subjects are either contrary or intermediate; for even privation must be regarded as contrary, and is expressed by a positive term, e.g. 'naked' or 'toothless'[1] or 'black'.

CHAPTER XII

If the categories are classified as substance, quality, place, acting or being acted on, relation, quantity, there must be three kinds of movement—of quality, of quantity, of place. There is no movement in respect of substance (because there is nothing contrary to substance), nor in respect of relation (for it is possible that if one of two things in relation changes, the relative term which was true of the other thing ceases to be true,[2] though this other does not change at all,—so that their movement is accidental), nor of agent and patient, nor of mover and moved, because there is no movement of movement nor generation of generation, nor, in general, change of change. For there *might* be movement of movement in two senses; (1) movement may be the subject moved, as a man is moved because he changes from white to black,—so that in this way movement might be either heated or cooled or change its place or increase. But this is impossible; for change is not a subject. Or (2) some other subject may change from a change into some other species of change (as a man changes from disease into health). But this also is not possible except incidentally. For every movement is change from something into something. (And so are generation and destruction; but changes into things opposed in certain ways are not movements.[3]) A thing changes, then, at the

[1] 'Toothless' is more obviously negative in form than the corresponding Greek word.
[2] 1068a 12 read *μεταβάλλοντος μὴ ἀληθεύεσθαι*. So, apparently, Al. apud Simpl. in *Phys*. Cf. N. 1088a 34.
[3] 1068a 25 read *ὡδὶ η ὡδὶ οὐ κινήσεις*. Change between contraries is

same time from health into illness, and from this change itself into another. Clearly, then,[1] if it has become ill, it will have changed into some change or other (though it *may*[2] be at rest), and, further, into a determinate change each time; and that new change will be from something definite into some other definite thing; therefore it will be the opposite change, that of growing well. We answer that this happens only incidentally, e.g. there is a change from the process of recollection to that of forgetting, only because *that to which the process attaches* is changing, now into a state of knowledge, now into one of ignorance.[3]

Further, the process will go on to infinity, if there is to be change of change and generation of generation. If the change produced is change of change, the change that produces it must be so too; e.g. if the simple coming to be was once
1068b coming to be, that which was coming to be it was also once coming to be; therefore that which was simply coming to be it was not yet in existence, but something which was coming to be coming to be it was already in existence.[4] And this was once coming to be, so that there must have been a time at which it was not yet. Now since of an infinite number of terms there is not a first, the first in this series will not exist, and therefore no following term will exist. Nothing, then, can either come to be or move or change. Further, that which has a movement has also the contrary movement and rest, and that which comes to be also ceases to be. Therefore that which is coming to be is ceasing to be when it has come to be coming to be; for it cannot cease to be at the very time at which it is coming to be coming to be, nor after it has come to be; for that which is ceasing to be must *be*.[5] Further,

movement, change between contradictories is generation or destruction.

[1] 1068a 27 read δῆλον δή.

[2] This is possible, though excluded by the theory in question.

[3] 1068a 33 read εἰς ἄγνοιαν.

[4] 1068b 1 read καὶ τὸ γιγνόμενον ἐγίγνετο· ὥστε οὔπω ἦν τὸ γιγνόμενον ἁπλῶς ἀλλὰ γιγνόμενόν τι ἦν γιγνόμενον ἤδη.

[5] If that which comes to be comes to be coming to be, it also ceases to be. When? Not when it is only coming to be coming to be, for then it is not and ∴ cannot cease to be; nor after it has come to be, for then also 'that which comes to be' is not and ∴ cannot cease to be. ∴ It is ceasing to be, at the very time when it is coming to be. Which is absurd.

there must be a matter underlying that which comes to be and changes. What will it be, then, that becomes movement or generation, as body or soul is that which suffers alteration? And what is it that they move into? For their movement must be the movement of a definite *A* from a definite *B* into a definite *C*, not movement without qualification.[1] How, then, can this condition be fulfilled? There can be no learning of learning, and therefore no generation of generation.[2]

Since there is not movement either of substance or of relation or of activity and passivity, it remains that movement is in respect of quality and quantity and place; for each of these admits of contrariety. By quality I mean not that which is in the substance (for even the differentia is a quality), but the passive quality, in virtue of which a thing is said to be acted on or to be incapable of being acted on.[3] The unmovable is either that which is wholly incapable of being moved, or that which is moved with difficulty in a long time or begins slowly, or that which would naturally be moved, but cannot be moved when and where and as it would naturally be moved. This alone among unmovables I describe as being at rest; for rest is contrary to movement, so that it must be a privation in that which is *receptive of movement*.[4]

Things which are in one place (in the strictest sense) are *together in place*, and things which are in different places are *apart*. Things whose extremes are together *touch*. That at which the changing thing, if it changes continuously according to its nature, naturally arrives before it arrives at the extreme into which it is changing, is *between*.[5] That which is most distant in a straight line is *contrary in place*. That is *successive* which is after the beginning (the order being determined by position or form or in some other way) and has nothing of the same class between it and that which it succeeds, e.g. lines succeed a line, units a unit, or one house another house. (There is nothing to prevent a thing of some *other* class from

[1] 1068^{b} 14 read *κίνησιν, μὴ κίνησιν ἁπλῶς*.

[2] 1068^{b} 14 read *μάθησις τῆς μαθήσεως, ὥστ'*. With 1067^{b} 14–1068^{b} 15 cf. *Phys.* v. 225^{a} 3–226^{a} 16.

[3] Cf. *Phys.* v. 226^{a} 23–29.

[4] Cf. *Phys.* v. 226^{b} 10–16.

[5] Cf. *Phys.* v. 226^{b} 21–25.

being between.) For the successive succeeds something and is something later; 'one' does not succeed 'two', nor the first 1069a day of the month the second. That which, being successive, touches, is *contiguous*. Since all change is between opposites, and these are either contraries or contradictories, and there is no middle term for contradictories, clearly that which is *between* is between contraries. The *continuous* is a species of the contiguous or of that which touches; two things are called continuous when the limits of each, with which they touch and are kept together, become one and the same, so that plainly the continuous is found in the things out of which a unity naturally arises in virtue of their contact. And plainly the successive is the first of these concepts; for the successive does not necessarily touch, but that which touches is successive. And if a thing is continuous, it touches, but if it touches, it is not necessarily continuous; and in things in which there is no touching, there is no organic unity. Therefore a point is not the same as a unit; for contact belongs to points, but not to units, which have only succession; and there is something between two of the former, but not between two of the latter.[1]

[1] Cf. *Phys.* v. 226b 32–227a 31.

BOOK XII (Λ)

CHAPTER I

SUBSTANCE is the subject of our inquiry; for the principles and the causes we are seeking are those of substances. For if the universe is of the nature of a whole, substance is its first part; and if it coheres merely by virtue of serial succession, on this view also substance is first, and is succeeded by quality, and then by quantity. At the same time these latter are not even being in the full sense, but are qualities and movements of it,—or else even the not-white and the not-straight would be being; at least we say even these *are*, e.g. 'there is a not-white[1]'. Further, none of the categories other than substance can exist apart. And the old philosophers also in effect testify to this; for it was of substance that they sought the principles and elements and causes. The thinkers of the present day tend to rank universals as substances (for genera are universals, and these they tend to describe as principles and substances, owing to the abstract nature of their inquiry); but the old thinkers ranked particular things as substances, e.g. fire and earth, but not what is common to both, body.

There are three kinds of substance—one that is sensible (of which one subdivision is eternal and another is perishable, and which all recognize, as comprising e.g. plants and animals),—of this we must grasp the elements, whether one or many; and another that is immovable, and this certain thinkers assert to be capable of existing apart, some dividing it into two, others combining the Forms and the objects of mathematics into one class, and others believing only in the mathematical part of this class.[2] The former two kinds of substance are the subject of physics (for they imply move-

[1] This is an implication of the ordinary type of judgement, 'x is not white.'

[2] The three views appear to have been held respectively by Plato, Xenocrates, and Speusippus.

ment); but the third kind belongs to another science, if there is no principle common to it and to the other kinds.

Sensible substance is changeable. Now if change proceeds from opposites or from intermediate points, and not from all opposites (for the voice[1] is not-white⟨, but it does not therefore change to white⟩), but from the contrary, there must be something underlying which changes into the contrary state; for the contraries do not change.

CHAPTER II

Further, something persists, but the contrary does not persist; there is, then, some third thing besides the contraries, viz. the matter. Now since changes are of four kinds—either in respect of the essence or of the quality or of the quantity or of the place, and change in respect of the individual nature is simple generation and destruction, and change in quantity is increase and diminution, and change in respect of an affection is alteration, and change in place is motion, changes will be from given states into those contrary to them in these several respects. The matter, then, which changes must be capable of both states. And since 'that which is' has two senses, we may say that everything changes from that which is potentially to that which is actually, e.g. from the potentially white to the actually white, and similarly in the case of increase and diminution. Therefore not only can a thing come to be, incidentally, out of that which is not, but also all things come to be out of that which is, but is potentially, and is not actually. And this is the 'One' of Anaxagoras; for instead of 'all things were together' and the 'Mixture' of Empedocles and Anaximander and the account given by Democritus, it is better to say all things were together potentially but not actually.[2] Therefore these thinkers seem to have had some notion of matter.

Now all things that change have matter, but[3] different

[1] 1069b 5 read *οὐ λευκὸν γὰρ ἡ φωνή.*

[2] 1069b 21 read *ἕν· βέλτιον γὰρ ἢ ὁμοῦ πάντα καὶ Ἐμπ. τὸ μῖγμα καὶ Ἀναξ. καὶ ὡς Δημ. φησιν, ἦν ὁμοῦ πάντα δυνάμει, ἐνεργείᾳ δ' οὔ,* following in part H. Jackson, *J. of P.* xxix. 139.

[3] 1069b 24 read *ἀλλ' ἑτέραν.*

matter; and of eternal things those which are not generable but are movable in space have matter—not matter for generation, however, but for motion from one place to another.

(One might raise the question from what sort of non-being generation proceeds; for 'non-being' has three senses.[1])

If, then, a thing exists potentially, still it is not potentially any and every thing, but different things come from different things; nor is it satisfactory to say that 'all things were together'; for they differ in their matter, since otherwise why did an infinity of things come to be, and not one thing? For 'reason[2]' is one, so that if matter also is one, that must have come to be in actuality which the matter was in potency.[3] The causes and the principles, then, are three, two being the pair of contraries of which one is definition and form and the other is privation, and the third being the matter.

CHAPTER III

Next we must observe that neither the matter nor the form comes to be—i. e. the proximate matter and form. For everything that changes is something and is changed by something and into something. That by which it is changed is the im- 1070a
mediate mover; that which is changed, the matter; that into which it is changed, the form. The process, then, will go on to infinity, if not only the bronze comes to be round but also the round or the bronze comes to be; therefore there must be a stop at some point.

Next we must observe that each substance comes into being out of something that shares its name. (Natural objects and other things both rank as substances.) For things come into being either by art or by nature or by luck or by spontaneity. Now art is a principle of movement in something other

[1] Alexander points out that ἀπορήσειε . . . ὄν refers to l. 20. The three senses are probably the absolutely non-existent, the false, and the potential.

[2] Sc. the νοῦς of Anaxagoras' doctrine, summarized by D. L. in the words, πάντα χρήματα ἦν ὁμοῦ· εἶτα νοῦς ἐλθὼν αὐτὰ διεκόσμησεν.

[3] Sc. an undifferentiated unity.

than the thing moved, nature is a principle in the thing itself (for man begets man[1]), and the other causes are privations of these two.

There are three kinds of substance—the matter, which acquires individuality[2] by being perceived (for all things that are characterized by contact and not by organic unity are matter and substratum); the nature (i. e. the individual character) that it moves towards, which is a positive state; and again, thirdly, the particular substance which is composed of these two, e. g. Socrates or Callias. Now in some cases the individual character does not exist apart from the composite substance, e. g. the form of house does not so exist, unless the art of building exists apart (nor is there generation and destruction of these forms, but it is in another way that the house apart from its matter, and health, and all ideals of art, exist and do not exist); but if the individual character exists apart from the concrete thing, it is only in the case of natural objects. And so Plato was not far wrong when he said that there are as many Forms as there are kinds of natural things (if there are Forms at all),—though not of such things[3] as fire, flesh, head; for all these are matter, and the last matter is the matter of that which is in the fullest sense substance. The moving causes exist as things preceding the effects, but causes in the sense of formulae are simultaneous with their effects. For when a man is healthy, then health also exists; and the shape of a bronze sphere exists at the same time as the bronze sphere. But we must examine whether any form also survives afterwards. For in some cases this may be so, e. g. the soul may be of this sort—not all soul but the reason; for doubtless it is impossible that *all* soul

[1] This is not a good instance of what A. says about nature, for the principle of generation is not in the child but in the father. The definition of nature applies better to other natural functions, such as growth. The note *ἄνθρωπος γὰρ ἄνθρωπον γεννᾷ* is hastily thrown in because A. is thinking mainly of his favourite thesis of *γένεσις ἐκ συνωνύμου*. Hence Alexander says *τοῦτο συνεχές ἐστι τῷ μετὰ ταῦτα ῥητέον ὅτι ἑκάστη ἐκ συνωνύμου γίνεται οὐσία.*

[2] Only a quasi-individuality, it is to be observed.

[3] 1070a 19 read *ἀλλ' οὐ τούτων*. *ἀλλ' οὐ* for MS. *ἄλλα* or *ἀλλά* seems necessary if *οἷον . . . τελευταία* is to be kept here. But there is much to be said for Alexander's proposal to transfer these words to l. 11, after *ὑποκείμενον*.

should survive. Evidently then there is no necessity, on this ground at least, for the existence of the Ideas. For man is begotten by man, each man by an individual father; and similarly in the arts; for the medical art is the formal cause of health.

CHAPTER IV

The causes and the principles of different things are in a sense different, but in a sense, if one speaks universally and analogically, they are the same for all. For we might raise the question whether the principles and elements are different or the same for substances and for relative terms, and similarly in the case of each of the categories. But it is paradoxical that they should be the same for all. For then from the same elements will proceed relative terms and substance. What then will this common element be? For (1) (*a*) there is 1070b
nothing common to and distinct from substance and the other categories, viz. those which are predicated; but the element is prior to the things of which it is an element. But again (*b*) substance is not an element in relative terms, nor is any of these an element in substance. Further, (2) how can all things have the same elements? For none of the elements can be the same as that which is composed of the elements, e. g. *b* or *a* cannot be the same as *ba*. (None, therefore,[1] of the intelligibles,[2] e. g. unity or being, is an element; for these are predicable of each of the compounds as well.) None of the elements then would be either a substance or a relative term; but it must be one or other. All things then have not the same elements.

Or, as we are wont to put it, in a sense they have and in a sense they have not; e. g. perhaps the elements of perceptible bodies are, as *form*, the hot, and in another sense the cold, which is the *privation*; and, as *matter*, that which directly and of itself is potentially these perceptible bodies; and both these are substances and also the things composed of these, of which these are the principles (i. e. any unity which is produced

[1] 1070b 7 read οὐδὲν δή.
[2] This is apparently almost a technical name for the abstract terms which are found in all the categories alike.

out of the hot and the cold, e.g. flesh or bone); for the product must be different from the elements. These things then have these elements and principles, but different things have different elements; and if we put the matter thus, all things have not the same elements, but analogically they have; i.e. one might say that there are three principles—the form, the privation, and the matter. But each of these is different for each class, e.g. in colour they are white, black, and surface. Again, there is light, darkness, and air; and out of these are produced day and night.

Since not only the elements present in a thing are causes, but also something external, i.e. the moving cause, clearly while 'principle' and 'element' are different both are causes, and 'principle' is divided into these two kinds[1]; and that which moves a thing or makes it rest is a principle and a substance. Therefore analogically there are three elements, and four causes and principles; but the elements are different in different things, and the proximate moving cause is different for different things. Health, disease, body; the moving cause is the medical art. Form, disorder of a particular kind, bricks; the moving cause is the building art.[2] And since the moving cause in the case of natural things is, for instance, man, and in the products of thought it is the form or its contrary, there are in a sense three causes, while in a sense there are four. For the medical art is in some sense health, and the building art is the form of the house, and man begets man;[3] further, besides these there is that which as first of all things moves all things.

CHAPTER V

Some things can exist apart and some cannot, and it is the
1071a former that are substances. And therefore all things have the same causes,[4] because, without substances, affections and

[1] i.e. the principles which are elements and those which are not.
[2] 1070b 29 omit καὶ . . . ἀρχή.
[3] i.e. the efficient cause is identical with the formal.
[4] i.e. the causes of substance are the causes of all things. Read ταὐτά in 1071a 1.

movements do not exist. Further, these causes will probably be soul and body, or reason and desire and body.

And in yet another way, analogically identical things are principles, i. e. actuality and potency; but these also are not only different for different things but also apply in different senses to them. For in some cases the same thing exists at one time actually and at another potentially, e. g. wine or flesh or man does so. (And these too fall under the above-named causes.[1] For the form exists actually, if it can exist apart, and so does the complex of form and matter, and the privation, e. g. darkness or the diseased. But the matter exists potentially; for this is that which can become both the actual things.) But the distinction of actuality and potentiality applies differently to cases where the matter of cause and of effect is not the same, in which cases the form also is not the same but different; e. g. the cause of man is (1) the elements in man (viz. fire and earth as matter, and the peculiar form), and the external cause, whatever it is, e. g. the father, and (2) besides these the sun and its oblique course, which are neither matter nor form nor privation of man nor of the same species with him, but moving causes.[2]

Further, one must observe that some causes can be expressed in universal terms, and some cannot. The proximate principles of all things are the actual proximate *individual*, and another *individual* thing which exists as a potency.[3] The

[1] i. e. the division into potency and actuality stands in a definite relation to the previous division into matter, form, and privation. τὸ ἐξ ἀμφοῖν is not strictly in point, but is suggested by the frequent division of οὐσία into ὕλη, εἶδος, and τὸ ἐξ ἀμφοῖν.

[2] Aristotle distinguishes two ways in which things may be related as δύναμις and ἐνέργεια. (1) The same thing is δυνάμει what it later comes to be ἐνεργείᾳ. The δύναμις may be the same as the ἐνέργεια in form (e. g. father and son) or in matter (e. g. wine and vinegar). But (2) one thing may be called δύναμις and another ἐνέργεια though they have nothing in common. Here δύναμις and ἐνέργεια practically = agent and patient, and δύναμις is the δύναμις κατὰ κίνησιν λεγομένη (transeunt potentiality or rather power) spoken of in Θ. 1. The movement of the sun in the ecliptic is the cause of generation and decay (*Phys.* ii. 194b 13, *De Gen. et Corr.* ii. 336a 15, 31) and is thus a transeunt δύναμις of each man who is born, while the material, formal, and proximate efficient causes are δυνάμεις of him in the other sense.

[3] e. g. the proximate causes of a child are the individual father (who on Aristotle's view is the efficient and contains the formal cause) and the germ contained in the individual mother (which is the material cause).

universal causes, then, of which we spoke do not *exist*. For the *individual* is the source of the individuals. For while man is the cause of man universally, there *is* no universal man; but Peleus is the cause of Achilles, and your father of you, and this particular *b* of this particular *ba*, though *b* in general is the cause of *ba* taken without qualification.

Then we must take account of the various species of substances. And different things have different causes and elements, as was said; the causes of things that are not in the same class, e.g. of colours, sounds, substances, and quantities, are different except in an analogical sense; and those of things in the same species are different, not in species, but in the sense that the causes of different individuals are different, your matter and form and moving cause being different from mine, while in their universal formula they are the same. And if we inquire [1] what are the principles or elements of substances and relations and qualities—whether they are the same or different, clearly when the terms 'principle' and 'element' are used in several senses the principles and elements of all are the same, but when the senses are distinguished the causes are not the same but different, except that in a special sense the causes of all are the same. They are in a special sense the same, i.e. (1) by analogy, because matter, form, privation, and the moving cause are common to all things; and (2) the causes of substances may be treated as causes of all things in this sense, that when they are removed all things are removed; further, (3) that which is first in respect of complete reality is the cause of all things. But in another sense there are different first [2] causes, viz. all the contraries which are neither stated as classes nor grouped under some ambiguous term; [3] and, further, the matters of different things are
1071^{b} different. We have stated, then, what are the principles of sensible things and how many they are, and in what sense they are the same and in what sense different.

[1] 1071^{a} 29 read τὸ δὲ ζητεῖν.

[2] 'First' is now taken in the sense of 'proximate', not of 'ultimate' as in τὸ πρῶτον ἐντελεχείᾳ.

[3] Sc. but taken as individual qualities. All things include εἶδος and στέρησις, but each thing has a distinct εἶδος and στέρησις of its own.

CHAPTER VI

Since there were three kinds of substance, two of them physical and one unmovable, regarding the latter we must assert that it is necessary that there should be an eternal unmovable substance. For substances are the first of existing things, and if they are all destructible, all things are destructible. But it is impossible that movement should either come into being or cease to be; for it must always have existed. Nor can time come into being or cease to be; for there could not be a before and an after if time did not exist. Movement also is continuous, then, in the sense in which time is; for time is either the same thing as movement or an attribute of movement. And there is no continuous movement except movement in place, and of this only that which is circular is continuous.

But if there is[1] something which is capable of moving things or acting on them, but is not actually doing so, there will not necessarily be movement: for that which has a potency need not exercise it. Nothing, then, is gained even if we suppose eternal substances, as the believers in the Forms do, unless there is to be in them some principle which can cause movement; and even this is not enough, nor is another substance besides the Forms enough; for if it does not *act*, there will be no movement. Further, even if it acts, this will not be enough, if its essence is potency; for there will not be *eternal* movement: for that which is potentially may possibly not be. There must, then, be such a principle, whose very essence is actuality. Further, then, these substances must be without matter; for they must be eternal, at least if anything else is eternal. Therefore they must be actuality.[2]

Yet there is a difficulty; for it is thought that everything that acts is able to act, but that not everything that is able to act acts, so that the potency is prior. But if this is so, nothing at all might exist; for it is possible for all things to be capable of existing but not yet to exist. Yet if we follow the mythologists who generate the world from night, or the natural philosophers who say that all things were together, the same

[1] 1071b 12 read εἰ ἔστι κινητικόν.

[2] 1071b 22 read ἐνέργεια.

impossible result ensues. For how will there be movement, if there is no actual cause? Wood will surely not move itself—the carpenter's art must act on it; nor will the *menses* nor the earth set themselves in motion, but the seeds must act on the earth and the *semen* on the *menses*.

This is why some suppose eternal actuality—e.g. Leucippus[1] and Plato[2]; for they say there is always movement. But why and what this movement is they do not say, nor, if the world moves in this way or that, do they tell us the cause of its doing so.[3] Now nothing is moved at random, but there must be some cause,[4] e.g. as a matter of fact a thing moves in one way by nature, and in another by force or through the influence of reason or something else. Further, what sort of movement is primary? This makes a vast difference. But again Plato, at least, cannot even say what it is that he some-
1072a times supposes to be the source of movement—that which moves itself;[5] for the *soul* is later, and simultaneous with the heavens, according to his account.[6] To suppose potency prior to actuality, then, is in a sense right, and in a sense not; and we have specified these senses.[7]

That actuality is prior is testified by Anaxagoras (for his 'reason' is actuality[8]) and by Empedocles in his doctrine of love and strife, and by those who say that there is always movement, e.g. Leucippus.

Therefore chaos or night did not exist for an infinite time, but the same things have always existed (either passing through a cycle of changes or obeying some other law), since actuality is prior to potency. If, then, there is a constant cycle, something must always remain,[9] acting in the same way. And if there is to be generation and destruction, there must be something else[10] which is always acting in different ways. This must, then, act in one way in virtue of itself, and in another

[1] Cf. *De Caelo*, iii. 300b 8.
[2] Cf. *Timaeus*, 30 A.
[3] 1071b 34 read *οὐδ' εἰ ὡδὶ ἢ ὡδί, τὴν αἰτίαν*.
[4] 1071b 35 read *δεῖ τι διὰ τί ὑπάρχειν*, following H. Jackson, *J. of P.* xxix. 141.
[5] Cf. *Phaedrus*, 245 C; *Laws*, 894 E.
[6] Cf. *Timaeus*, 34 B.
[7] Cf. 1071b 22–26.
[8] 1072a 5 read *ἐνέργεια*. So perhaps Alexander.
[9] i.e. the sphere of the fixed stars.
[10] i.e. the spheres of the sun, moon, and planets. Cf. *de Gen. et Corr.* ii. 336a 23.

in virtue of something else—either of a third agent, therefore, or of the first. But it must be in virtue of the first. For otherwise this again causes the motion both of the third agent[1] and of the second. Therefore it is better to say 'the first'. For it was the cause of eternal movement; and something else is the cause of variety, and evidently both together are the cause of eternal variety. This, accordingly, is the character which the motions actually exhibit. What need then is there to seek for other principles?

CHAPTER VII

Since (1) this is a possible account of the matter, and (2) if it were not true, the world would have proceeded out of night and 'all things together' and out of non-being, these difficulties may be taken as solved. There is, then, something which is always moved with an unceasing motion, which is motion in a circle; and this is plain not in theory only but in fact. Therefore the first heavens[2] must be eternal. There is therefore also something which moves them. And since that which is moved and moves is intermediate, there is a mover[3] which moves without being moved, being eternal, substance, and actuality. And the object of desire and the object of thought move in this way; they move without being moved. The primary objects of desire and of thought are the same. For the apparent good is the object of appetite, and the real good is the primary object of rational desire. But desire is consequent on opinion rather than opinion on desire; for the thinking is the starting-point. And thought is moved by the object of thought, and one side of the list of opposites[4] is in itself the object of thought; and in this, substance is first, and in substance, that which is simple and exists actually. (The one and the simple are not the same; for 'one' means a measure, but 'simple' means that the thing itself has a certain nature.)

[1] 1072^{a} 14 read αὐτῷ.

[2] i. e. the outer sphere of the universe, that in which the fixed stars are set.

[3] 1072^{a} 24 read κινοῦν μέσον, κινοῦν ἐστί.

[4] Cf. note on A. 986^{a} 23.

But the good, also, and that which is in itself desirable are on this same side of the list; and the first in any class is always best, or analogous to the best.[1]

1072b That the final cause may be something unmovable, is shown by the distinction of its meanings. For the final cause is (*a*) something for whose good the action is done, and (*b*) something at which the action aims; and of these the latter is unmovable though the former is not. The final cause, then,[2] produces motion by being loved, and by that which it moves, it moves all other things. Now if something is moved it is capable of being otherwise than as it is. Therefore if the actuality of the heavens is primary motion, then in so far as they are in motion, in *this* respect they are capable of being otherwise,—in place,[3] even if not in substance. But since there is something which moves while itself unmoved, existing actually, this can in no way be otherwise than as it is. For motion in space is the first of the kinds of change, and motion in a circle the first kind of spatial motion; and this the first mover *produces*.[4] The first mover, then, of necessity exists; and in so far as it is necessary, it is good,[5] and in this sense a first principle. For the necessary has all these senses—that which is necessary perforce because it is contrary to the natural impulse, that without which the good is impossible, and that which cannot be otherwise but is *absolutely* necessary.

On such a principle, then, depend the heavens and the world of nature. And its life is such as the best which we enjoy,

[1] Sc. where there is no best in the strict sense. The argument for the identity of the primary forms of τὸ ὀρεκτόν and τὸ νοητόν is not very clearly stated, but seems to be as follows. The ὀρεκτόν is the καλόν. (In parenthesis it is stated that desire depends on thought rather than thought on desire.) The positive side of the list of contraries is the object of thought, and the first term on this side (which must be the primary object of thought) is simple actual substance. But the object of desire, which we have seen to be the καλόν, is on the same side of the list, and therefore the first member of that list (the primary object of thought) must be the primary object of desire.

[2] 1072b 3 read κινεῖ δή.

[3] 1072b 5 read εἰ φορὰ πρώτη ἡ ἐνέργειά ἐστιν, ᾗ κινεῖται ταύτῃ γ' ἐνδέχεται ἄλλως ἔχειν, κατὰ τόπον.

[4] If it had any movement, it would have the first. But it produces this and therefore (on the principle that one movement belongs to one thing) cannot share in it.

[5] i.e. it is necessary in the sense of οὗ οὐκ ἄνευ τὸ εὖ, and is ∴ good.

and enjoy for but a short time. For it is ever in this state (which we cannot be), since its actuality is also pleasure. (And therefore[1] are waking, perception, and thinking most pleasant, and hopes and memories are so because of their reference to these.) And thought in itself deals with that which is best in itself, and that which is thought in the fullest sense with that which is best in the fullest sense. And thought thinks itself because it shares the nature of the object of thought; for it becomes an object of thought in coming into contact with and thinking its objects, so that thought and object of thought are the same. For that which is *capable* of receiving the object of thought, i. e. the essence, is thought. And it is *active* when it *possesses* this object. Therefore the latter ⟨possession⟩ rather than the former ⟨receptivity⟩[2] is the divine element which thought seems to contain, and the act of contemplation is what is most pleasant and best. If, then, God is always in that good state in which we sometimes are, this compels our wonder; and if in a better this compels it yet more. And God *is* in a better state. And life also belongs to God; for the actuality of thought is life, and God is that actuality; and God's essential actuality is life most good and eternal. We say therefore[3] that God is a living being, eternal, most good, so that life and duration continuous and eternal belong to God; for this *is* God.

Those who suppose, as the Pythagoreans[4] and Speusippus[5] do, that supreme beauty and goodness are not present in the beginning, because the beginnings both of plants and of animals are *causes*, but beauty and completeness are in the *effects* of these,[6] are wrong in their opinion. For the seed comes from other individuals which are prior and complete, and the first thing is not seed but the complete being, e. g. we must say 1073a
that before the seed there is a man,—not the man produced from the seed, but another from whom the seed comes.

It is clear then from what has been said that there is a substance which is eternal and unmovable and separate from

[1] Sc. because they are activities or actualities.
[2] 1072b 23 read ἐκείνου μᾶλλον τοῦτο.
[3] 1072b 28 read φαμὲν δή.
[4] Cf. N. 1091a 34.
[5] Cf. Z. 1028b 21, N. 1091a 34, 1092a 11.
[6] i. e. the animal or plant is more fair and perfect than the seed.

sensible things. It has been shown [1] also that this substance cannot have any magnitude, but is without parts and indivisible. For it produces movement through infinite time, but nothing finite has infinite power. And, while every magnitude is either infinite or finite, it cannot, for the above reason, have finite magnitude, and it cannot have infinite magnitude because there is no infinite magnitude at all. But it is also clear that it is impassive and unalterable; for all the other changes are posterior to [2] change of place. It is clear, then, why the first mover has these attributes.

CHAPTER VIII

We must not ignore the question whether we have to suppose one such substance or more than one, and if the latter, how many; we must also mention, regarding the opinions expressed by others, that they have said nothing, that can even be clearly stated, about the number of the substances. For the theory of Ideas has no special discussion of the subject; for those who believe in Ideas say the Ideas are numbers, and they speak of numbers now as unlimited, now as limited by the number 10; but as for the reason why there should be just so many numbers, nothing is said with any demonstrative exactness.

We however must discuss the subject, starting from the presuppositions and distinctions we have mentioned. The first principle or primary being is not movable either in itself or accidentally, but produces the primary eternal and single movement. And since that which is moved must be moved by something, and the first mover must be in itself unmovable, and eternal movement must be produced by something eternal and a single movement by a single thing, and since we see that besides the simple spatial movement of the universe, which we say the first and unmovable substance produces, there are other spatial movements—those of the planets—which are eternal (for the body which moves in a circle is eternal and unresting; we have proved these

[1] Cf. *Phys.* viii. 267^b 17; *De Caelo*, i. 275^b 22.
[2] i. e. impossible without.

points in the physical treatises[1]), each of *these* movements also must be caused by a substance unmovable in itself and eternal. For the nature of the stars[2] is eternal, being a kind of substance, and the mover is eternal and prior to the moved, and that which is prior to a substance must be a substance. Evidently, then, there must be substances which are of the same number as the movements of the stars, and in their nature eternal, and in themselves unmovable, and without magnitude, for the reason before mentioned.[3]

That the movers are substances, then, and that one of these 1073b
is first and another second according to the same order as the movements of the stars, is evident. But in the number of movements we reach a problem which must be treated from the standpoint of that one of the mathematical sciences which is most akin to philosophy—viz. of astronomy; for this science speculates about substance which is perceptible but eternal, but the other mathematical sciences, i.e. arithmetic and geometry, treat of no substance. That the movements are more numerous than the bodies that are moved, is evident to those who have given even moderate attention to the matter; for each of the planets has more than one movement. But as to the actual number of these movements, we now—to give some notion of the subject—quote what some of the mathematicians say, that our thought may have some definite number to grasp; but, for the rest, we must partly investigate for ourselves, partly learn from other investigators, and if those who study this subject form an opinion contrary to what we have now stated, we must esteem both parties indeed, but follow the more accurate.

Eudoxus supposed that the motion of the sun or of the moon involves, in either case, three spheres, of which the first is the sphere of the fixed stars, and the second moves in the circle which runs along the middle of the zodiac, and the third in the circle which is inclined across the breadth of the zodiac; but the circle in which the moon moves is inclined at a greater angle than that in which the sun moves. And the motion of the

[1] Cf. *Phys.* viii. 8, 9; *De Caelo*, i. 2, ii. 3–8.

[2] This is to be understood as a general term including both fixed stars and planets.

[3] Cf. 1073a 5.

planets involves, in each case, four spheres, and of these also the first and second are the same as the first two mentioned above (for the sphere of the fixed stars is that which moves all the other spheres, and that which is placed beneath this and has its movement in the circle which bisects the zodiac is common to all), but the *poles* of the third sphere of each planet are in the circle which bisects the zodiac, and the motion of the fourth sphere is in the circle which is inclined at an angle to the equator of the third sphere; and the poles of the third spheres are different for the other planets, but those of Venus and Mercury are the same.

Callippus made the position of the spheres, i. e. the order of their intervals, the same as Eudoxus did, but while he assigned the same number as Eudoxus did to Jupiter and to Saturn, he thought two more spheres should be added to the sun and two to the moon, if we were to explain the observed facts, and one more to each of the other planets.

But it is necessary, if all the spheres combined are to
1074a explain the phenomena, that for each of the planets there should be other spheres (one fewer than those hitherto assigned) which counteract those already mentioned and bring back to the same position the first or outermost sphere of the star which in each case is situated below[1] the star in question; for only thus can all the forces at work produce the observed motion of the planets. Since, then, the spheres by which the planets themselves are moved are—eight for Saturn and Jupiter and twenty-five for the others, and of these only those by which the lowest-situated planet is moved need not be counteracted, the spheres which counteract those of the first or outermost two planets will be six in number, and the spheres which counteract those of the next four planets will be sixteen, and the number of all the spheres—those which move the planets and those which counteract these—will be fifty-five. And if one were not to add to the moon and to the sun the movements we mentioned, all the spheres will be forty-nine in number.[2]

Let this then be taken as the number of the spheres,

[1] i.e. inwards from, the universe being thought of as a system of concentric spheres encircling the earth.

[2] 1074a 13 Sosigenes' conjecture *ἐννέα* appears to be necessary.

so that both the unmovable and the perceptible substances and principles may *probably* be taken as just so many; the assertion of *necessity* must be left to more powerful thinkers.

If there can be no spatial movement which does not conduce to the moving of a star, and if further every being and every substance which is immune from change and in virtue of itself has attained to the best must be considered an end, there can be no other being apart from these we have named, but this must be the number of the substances. For if there are others, they will cause change as being a final cause of movement; but there *cannot* be other movements besides those mentioned. And it is reasonable to infer this from a consideration of the bodies that are moved; for if everything that moves is for the sake of that which is moved, and every movement belongs to something that is moved, no movement can be for the sake of itself or of another movement, but all movements must be for the sake of the stars. For if a movement is to be for the sake of a movement, this latter also will have to be for the sake of something else; so that since there cannot be an infinite regress, the end of every movement will be one of the divine bodies which move through the heaven.[1]

Evidently there is but one heaven. For if there are many heavens as there are many men, the moving principles, of which each heaven will have one, will be one in form but in number many. But all things that are many in number have matter. (For one and the same formula applies to *many* things, e.g. the formula of man; but Socrates is *one*.[2]) But the primary essence has not matter; for it is complete reality. So the unmovable first mover is one both in formula and in number; therefore also that which is moved always and continuously is one alone; therefore there is one heaven alone.

Our forefathers in the most remote ages have handed down 1074b

[1] The argument is:—Each unchangeable perfect substance is an end and must ὡς ὀρεκτόν produce a distinct motion. But every motion is ultimately for the sake of a φερόμενον, and as we have enumerated the motions necessary for the φερόμενα, there can be no more motions and therefore no more unchangeable perfect substances.

[2] i.e. the λόγος is common to all men, so that it must be matter which gives Socrates his uniqueness.

to us their posterity a tradition, in the form of a myth, that these substances are gods and that the divine encloses the whole of nature. The rest of the tradition has been added later in mythical form with a view to the persuasion of the multitude and to its legal and utilitarian expediency; they say these gods are in the form of men or like some of the other animals, and they say other things consequent on and similar to these which we have mentioned. But if we were to separate the first point from these additions and take it alone—that they thought the first substances to be gods, we must regard this as an inspired utterance, and reflect that, while probably each art and science has often been developed as far as possible and has again perished, these opinions have been preserved until the present, like relics of the ancient treasure. Only thus far, then, is the opinion of our ancestors and our earliest predecessors clear to us.

CHAPTER IX

The nature of the divine thought involves certain problems; for while thought is held to be the most divine of things observed by us, the question what it must be in order to have that character involves difficulties. For if it thinks nothing, what is there here of dignity? It is just like one who sleeps. And if it thinks, but this depends on something else, then (as that which is its substance is not the act of thinking, but a potency) it cannot be the best substance; for it is through thinking that its value belongs to it. Further, whether its substance is the faculty of thought or the act of thinking, what does it think? Either itself or something else; and if something else, either the same always or something different. Does it matter, then, or not, whether it thinks the good or any chance thing? Are there not some things about which it is incredible that it should think? Evidently, then, it thinks that which is most divine and precious, and it does not change; for change would be change for the worse, and this would be already a movement.[1] First, then, if 'thought' is not the act

[1] Sc. while νοῦς is *ex hypothesi* unmovable.

of thinking but a potency, it would be reasonable to suppose that the continuity of its thinking is wearisome to it. Secondly, there would evidently be something else more precious than thought, viz. that which is thought. For both thinking and the act of thought will belong even to one who has the worst of thoughts. Therefore if this ought to be avoided (and it ought, for there are even some things which it is better not to see than to see), the act of thinking cannot be the best of things. Therefore it must be itself that thought thinks (since it is the most excellent of things), and its thinking is a thinking on thinking.

But evidently knowledge and perception and opinion and understanding have always something else as their object, and themselves only by the way. Further, if thinking and being thought are different, in respect of which does goodness belong to thought? For the act of thinking and the object of thought have not the same *essence*. We answer that in some cases the knowledge is the object. In the productive 1075a
sciences (if we abstract from the matter) the substance in the sense of essence, and in the theoretical sciences the formula or the act of thinking, *is* the object. As, then, thought and the object of thought are not different in the case of things that have not matter, they will be the same, i.e. the divine thinking will be one with the object of its thought.

A further question is left—whether the object of the divine thought is composite; for if it were, thought would change in passing from part to part of the whole. We answer that everything which has not matter is indivisible. As human thought, or rather the thought of composite objects, is in a certain period of time (for it does not possess the good at this moment or at that, but its best, being something *different* from it, is attained only in a whole period of time), so throughout eternity is the thought which has *itself* for its object.

CHAPTER X

We must consider also in which of two ways the nature of the universe contains the good or the highest good, whether as something separate and by itself, or as the order of the parts. Probably in both ways, as an army does. For the good is found both in the order and in the leader, and more in the latter; for he does not depend on the order but it depends on him. And all things are ordered together somehow, but not all alike,—both fishes and fowls and plants; and the world is not such that one thing has nothing to do with another, but they are connected. For all are ordered together to one end. (But it is as in a house, where the freemen are least at liberty to act at random, but all things or most things are already ordained for them, while the slaves and the beasts do little for the common good, and for the most part live at random; for this is the sort of principle that constitutes the nature of each.) I mean, for instance, that all must at least come to be dissolved into their elements,[1] and there are other functions similarly in which all share for the good of the whole.

We must not fail to observe how many impossible or paradoxical results confront those who hold different views from our own, and what are the views of the subtler thinkers, and which views are attended by fewest difficulties. All make all things out of contraries. But neither 'all things' nor 'out of contraries' is right; nor do they tell us how the things in which the contraries are present can be made out of the contraries; for contraries are not affected by one another. Now for us this difficulty is solved naturally by the fact that there is a third factor.[2] These thinkers however make one of the two contraries matter; this is done for instance by those who make the unequal matter for the equal, or the many matter for the one. But this also is refuted in the same way; for the matter which is one for all things is contrary to nothing.

[1] Sc. in order that higher forms of being may be produced by new combinations of the elements.
[2] i.e. the substratum.

Further, all things, except the one, will, on the view we are criticizing, partake of evil; for the bad is itself one of the two elements. But the other school does not treat the good and the bad even as principles; yet in all things the good is in the highest degree a principle. The school we first mentioned is right in saying that it is a principle, but *how* the good is a principle they do not say—whether as end or as mover or as form.

Empedocles[1] also has a paradoxical view; for he identifies 1075b
the good with love. But this is a principle both as mover (for it brings things together) and as matter (for it is part of the mixture). Now even if it happens that the same thing is a principle both as matter and as mover, still the being, at least, of the two is not the same. In which respect then is love a principle? It is paradoxical also that strife should be imperishable; strife is the very nature of the bad.

Anaxagoras makes the good a motive principle; for reason moves things, but moves them for an end, which must be something other than it, except according to *our* way of stating the case; for, on our view, the medical art is in a sense health. It is paradoxical also not to suppose a contrary to the good, i.e. to reason. But all who speak of the contraries make no use of the contraries, unless we bring their views into shape. And why some things are perishable and others imperishable, no one tells us; for they make all existing things out of the same principles. Further, some make existing things out of the non-existent; and others to avoid the necessity of this make all things one.

Further, why should there always be becoming, and what is the cause of becoming?—this no one tells us. And those who suppose two principles must suppose another, a superior principle, and so must those who believe in the Forms[2]; for why did things come to participate, or why do they participate, in the Forms? And all other thinkers are confronted by the necessary consequence that there is something contrary to Wisdom, i.e. to the highest knowledge; but *we* are not. For there is nothing contrary to that which is primary (for all

[1] Cf. A. 985a 4.
[2] 1075b 19 read ἔτι ἄλλη ἀρχὴ κυριωτέρα.

contraries have matter and are potentially the same); and the ignorance which is contrary to philosophy would need a contrary object[1]; but what is primary has no contrary.

Again, if besides sensible things no others exist, there will be no first principle, no order, no becoming, no heavenly bodies, but each principle will have a principle before it, as in the accounts of the mythologists and all the natural philosophers. But if the Forms or the numbers are to exist, they will be causes of nothing; or if not that, at least not of movement.

Further, how is extension, i. e. a *continuum*, to be produced out of unextended parts? For number will not, either as mover or as form, produce a *continuum*. But again there cannot be any contrary that is also a productive or moving principle; for it would be possible for it not to be.[2] Or at least its action would be posterior to its potency. The world then would not be eternal. But it is; one of these premises, then, must be denied. And we have said how this must be done.[3] Further, in virtue of what the numbers, or the soul and the body, or in general the form and the thing, are one—of this no one tells us anything; nor can any one tell, unless he says, as we do, that the mover makes them one. And those who say[4] mathematical number is first and go on to generate one kind of substance after another and give
1076a different principles for each, make the substance of the universe a mere series of episodes (for one substance has no influence on another by its existence or non-existence), and they give us many governing principles; but the world must not be governed badly.

'The rule of many is not good; one is the ruler.'[5]

[1] 1075b 23 read ἄγνοια ἔσται τοῦ ἐναντίου. The passage is very difficult, but this reading, which may have been Alexander's, gives a tolerable sense. If there were an ignorance contrary to philosophy, it would have an object contrary to τὸ πρῶτον, which is the object of philosophy. But τὸ πρῶτον has no contrary.

[2] Since contraries must contain matter, and matter implies potentiality and contingency.

[3] Cf. 1071b 22.

[4] Cf. Z. 1028b 21, N. 1090b 13.

[5] 1076a 5 omit ἔστω. Cf. *Iliad*, ii. 204.

BOOK XIII (M)

CHAPTER I

WE have stated what is the substance of sensible things, dealing in the treatise on physics[1] with the material substratum, and later[2] with the substance which has actual existence. Now since our inquiry is whether there is or is not besides the sensible substances any which is immovable and eternal, and, if there is, what it is, we must first consider what is said by others, so that, if there is anything which they say wrongly, we may not be liable to the same objections, while, if there is any opinion common to them and us, we shall not quarrel with ourselves on that account; for one must be content to state some points better than one's predecessors, and others no worse.

Two opinions are held on this subject; it is said that the objects of mathematics—i. e. numbers and lines and the like—are substances, and again that the Ideas are substances. And since (1) some recognize these as two different classes—the Ideas and the mathematical numbers, and (2) some recognize both as having one nature, while (3) some others say that the mathematical substances are the only substances, we must consider[3] the objects of mathematics, not qualifying them by any other characteristic—not asking, for instance, whether they are Ideas or not, or whether they are the principles and substances of existing things or not, but only whether as the objects of mathematics they exist or not, and if they do, how they exist; then after this we must separately consider[4] the Ideas themselves in a general way, and only as far as systematic treatment demands; for most of what we have to say has been repeatedly stated in popular works. And the greater part of our account[5] must attack the

[1] *Phys.* i. 6–9. [2] *Met.* ZHΘ. [3] Cf. ch. 2, 3. [4] Cf. ch. 4, 5. [5] Cf. ch. 6–9.

inquiry already mentioned,[1] viz. whether the substances and the principles of existing things are numbers and Ideas; for after the discussion of the Ideas this remains as a third inquiry.

If the objects of mathematics exist, then they must exist either in sensible objects, as some say, or separate from sensible objects (and this also is said by some), or if they exist in neither of these ways, either they do not exist, or they exist only in some special sense. So that the subject of our discussion will be not whether they exist but how they exist.

CHAPTER II

That it is impossible for mathematical objects to exist *in* sensible things and at the same time that the doctrine in question is a fanciful one, has been said already in our
1076b discussion of difficulties[2],—the reasons being that it is impossible for two solids to be in the same place, and that according to the same argument all the other powers and characteristics also[3] should exist in sensible things—none of them existing separately. This we have said already. But, further, it is obvious that on this theory it is impossible for any body whatever to be divided; for it would have to be divided at a plane, and the plane at a line, and the line at a point, so that if the point cannot be divided, neither can the line, and if the line cannot, neither can the plane nor the solid. What difference then does it make whether sensible things are such indivisible entities, or, without being so themselves, have indivisible entities in them? The result will be the same; if the sensible things are divided the others will be divided too, or else not even the sensible things can be divided.

But, again, it is not possible that such entities should exist *separately*. For if besides the sensible solids there are to be other solids which are separate from them and prior to the sensible solids, it is plain that besides the planes also there

[1] Cf. l. 24 πότερον ἀρχαί, &c. [2] Cf. B. 998a 7-19.

[3] Which nevertheless the theory in question represents as Ideas apart from sensible things.

must be other and separate planes and points and lines; for consistency requires this. But if these exist, again besides the planes and lines and points of the mathematical solid there must be others which are separate. For the incomposite is prior to the compound; and if there are, prior to the sensible bodies, bodies which are not sensible, by the same argument the planes which exist by themselves must be prior to those which are in the motionless solids. Therefore these will be planes and lines other than those that exist along with the mathematical solids to which these thinkers assign separate existence; for the latter exist along with the mathematical solids, while the others are prior to the mathematical solids. Again, there will be, belonging to these planes, lines, and prior to them there will have to be, by the same argument, other lines and points; and prior to these points in the prior lines there will have to be other points, though there will be no others prior to these. Now (1) the accumulation becomes absurd; for we find ourselves with one set of solids apart from the sensible solids; three sets of planes apart from the sensible planes—those which exist apart from the sensible planes, and those in the mathematical solids, and those which exist apart from those in the mathematical solids; four sets of lines, and five sets of points. With which of these, then, will the mathematical sciences deal? Certainly not with the planes and lines and points in the motionless solid; for science always deals with what is prior. And (2) the same account will apply also to numbers; for there will be another set of units apart from each set of points, and also apart from each set of realities, from the objects of sense[1] and again from those of thought; so that there will be various classes of mathematical numbers.[2]

Again, how is it possible to solve the questions which we enumerated in our discussion of difficulties[3]? For besides 1077a
the sensible things there will be, on similar principles, the things with which astronomy and those with which geometry deals; but how is it possible that a heaven and its parts—or indeed anything which has movement—should exist apart

[1] 1076b 38 read ὄντα, τὰ αἰσθητά. [2] 1076b 39 omit ἄπειρα.
[3] B. 997b 12–34.

from the sensible heaven? Similarly also the objects of optics and harmonics will exist apart; for there will be voice and sight besides the sensible or individual voices and sights. Therefore it is plain that the other senses as well, and the other objects of sense, will exist apart; for why should one set of them do so and another not? And if this is so, animals also will exist apart, since the senses will.

Again, there are certain mathematical theorems of a universal character, extending beyond these substances. Here then we shall have another substance intermediate between, and separate from, the Ideas and the intermediates,[1]—a substance which is neither number nor points nor spatial magnitude nor time. And if this is impossible, plainly it is also impossible that the *former* substances should exist separate from sensible things.

And, in general, conclusions contrary alike to the truth and to the usual views follow, if one supposes the objects of mathematics to exist thus as separate entities. For if they exist thus they must be prior to sensible spatial magnitudes, but in truth they must be posterior; for the incomplete spatial magnitude is in the order of generation prior, but in the order of substance posterior, as the lifeless is to the living.

Again, what in the world will make[2] mathematical magnitudes one? For things in our perceptible world are one in virtue of soul, or of a part of soul, or of something else, reasonably enough[3]; when these are not present, the thing is a plurality, and splits up into parts. But in the case of the subjects of mathematics, which are divisible and are quantities, what is the cause of their being one and holding together?

Again, the modes of generation of the objects of mathematics show that we are right. For the dimension first generated is length, then comes breadth, lastly depth, and the process is complete. If, then, that which is posterior in the order of generation is prior in the order of substance, the solid will be prior to the plane and the line. And in *this* way also it is more complete and more whole, because it can

[1] A Platonic expression for *τὰ μαθηματικά*, which were regarded as intermediate between Ideas and sensible things.

[2] 1077a 20 read *τίνι καί ποτ'*.

[3] 1077a 22 read *τινί, εὐλόγως*.

become animate. How, on the other hand, could a line or a plane be animate? The supposition passes the power of our senses.

Again, the solid is a sort of substance; for it already has in a sense completeness. But how can lines be substances? Neither as a form or shape, as the soul perhaps is, nor as matter, like the solid; for we have no experience of anything that can be put together out of lines or planes or points, while if these had been a sort of material substance, we should have observed things which could be put together out of them.

Grant that they are prior in formula. Still not all things 1077b
which are prior in formula are prior in substance. For those things are prior in substance which when separated from other things surpass them in the power of independent existence, but those are prior in formula out of whose formulae the formulae of other things are compounded; and these two properties are not co-extensive. For if attributes, such as 'moving' or 'white', do not exist apart from their substances, the white is prior to the white man in formula, but not in substance. For it cannot exist separately, but is always along with the concrete thing; and by the concrete thing I mean the white man. Therefore it is plain that neither is the result of abstraction prior nor that which is produced by adding determinants posterior; for it is by adding a determinant to the white that we speak of the white man.

It has, then, been sufficiently pointed out that the objects of mathematics are not substances in a higher sense than bodies are, and that they are not prior to sensibles in being, but only in formula, and that they cannot in any way exist separately. But since they could not exist *in* sensibles either, it is plain that they either do not exist at all or exist in a special sense and therefore do not 'exist' without qualification. For 'exist' has many senses.

CHAPTER III

Just as the universal part of mathematics deals not with objects which exist separately, apart from extended magnitudes and from numbers, but with magnitudes and numbers, not however *qua* such as to have magnitude or to be divisible,[1] clearly it is possible that there should also be both propositions and demonstrations about sensible magnitudes, not however *qua* sensible but *qua* possessed of certain definite qualities.[2] For as there are many propositions about things merely considered as in motion, apart from the essence of each such thing and from their accidents, and as it is not therefore necessary that there should be either a mobile separate from sensibles, or a separate mobile substance in the sensibles, so too in the case of mobiles there will be propositions and sciences which treat them not *qua* mobile but only *qua* bodies, or again only *qua* planes, or only *qua* lines, or *qua* divisibles, or *qua* indivisibles having position, or only *qua* indivisibles.

Thus since it is true to say without qualification that not only things which are separable but also things which are inseparable exist—for instance, that mobiles exist,—it is true also to say, without qualification, that the objects of mathematics exist, and with the character ascribed to them by mathematicians. And it is true to say of the other sciences too, without qualification, that they deal with such and such a subject—not with what is accidental to it (e.g. not with the white, if the white thing is healthy, and the science has the healthy as its subject), but with that which is the subject
1078a of each science[3]—with the healthy if it treats things *qua* healthy, with man if *qua* man. So too is it with geometry; if its subjects happen to be sensible, though it does not treat them *qua* sensible, the mathematical sciences will not for that reason be sciences of sensibles—nor, on the other hand, of other things separate from sensibles.

[1] Cf. E. 1026a 25, M. 1077a 9.

[2] i. e. as universal mathematics abstracts from the distinctions between different kinds of μαθηματικά, so geometry abstracts from the sensible characteristics of magnitudes and attends only to their spatial relations.

[3] 1077b 36 read εἰ τὸ λευκὸν ὑγιεινόν, . . . ἐκείνου οὗ ἐστιν ἑκάστη.

Many properties attach to things in virtue of their own nature as possessed of some such differentia; e.g. there are attributes peculiar to the animal *qua* female or *qua* male, yet there is no 'female' nor 'male' separate from animals. And so also there are attributes which belong to things merely as lengths or as planes. And in proportion as we are dealing with things which are prior in formula and simpler, our knowledge will have more accuracy, i.e. simplicity. Thus a science which abstracts from the magnitude of things is more precise than one which takes it into account; and a science is most precise if it abstracts from movement, but if it takes account of movement, it is most precise if it deals with the primary movement, for this is the simplest; and of this again uniform movement is the simplest form. The same account may be given of harmonics and optics; for neither considers its objects *qua* sight or *qua* voice, but *qua* lines and numbers; but the latter are attributes proper to the former. And mechanics too proceeds in the same way. Thus if we suppose attributes separated from their fellow-attributes and make any inquiry concerning them as such, we shall not for this reason be in error, any more than when one draws a line on the ground and calls it a foot long when it is not; for the error is not included in the premises.

Each question will be best investigated in this way—by supposing separate what is not separate, as the arithmetician and the geometer do. For a man *qua* man is one indivisible thing; and the arithmetician supposes one indivisible thing, and then considers whether any attribute belongs to a man *qua* indivisible. But the geometer treats him neither *qua* man nor *qua* indivisible, but as a solid. For evidently the attributes which would have belonged to him even if he had not been indivisible, can belong to him apart from these attributes.[1] Thus, then, geometers speak correctly—they talk about existing things, and their subjects do exist; for being has two forms—it exists not only in complete reality but also as matter.

Now since the good and the beautiful are different (for the former always implies conduct as its subject, while the beautiful is found also in motionless things), those who assert

[1] Sc. indivisibility and humanity. 1078a 28 omit τὸ δυνατόν.

that the mathematical sciences say nothing of the beautiful or the good are in error. For these sciences say and prove a very great deal about them; for if they do not expressly mention them, but prove attributes which are their results or their defining formulae, it is not true to say that they tell us nothing about them. The chief forms of beauty are order and
1078b symmetry and definiteness, which the mathematical sciences demonstrate in a special degree. And since these (e.g. order and definiteness) are obviously causes of many things, evidently these sciences must treat this sort of causative principle also (i.e. the beautiful) as in some sense a cause. But we shall speak more plainly elsewhere[1] about these matters.

CHAPTER IV

So much then for the objects of mathematics; we have said that they exist and in what sense they exist, and in what sense they are prior and in what sense not prior. Now, regarding the Ideas, we must first examine the ideal theory by itself, not connecting it in any way with the nature of numbers, but treating it in the form in which it was originally understood by those who first maintained the existence of Ideas. The supporters of the ideal theory were led to it because they were persuaded of the truth of the Heraclitean doctrine that all sensible things are ever passing away, so that if knowledge or thought is to have an object, there must be some other and permanent entities, apart from those which are sensible; for there can be no knowledge of things which are in a state of flux. Socrates occupied himself with the excellences of character, and in connection with them became the first to raise the problem of universal definitions—for in the realm of physics the problem was only touched on by Democritus, who defined, after a fashion, the hot and the cold; while the Pythagoreans had before this treated of a few things, whose definitions they connected with numbers—e.g. opportunity, justice, or marriage[2]. But it was natural that Socrates should seek the essence. For he was seeking to syllogize, and the essence is the starting-point of syllogisms. For there was as yet none of the dialectical

[1] Cf. Λ. 7. 1072a 34, 10, N. 4. [2] Cf. Diels, *Vorsokratiker*, p. 270, § 4.

power which enables people even without knowledge of the essence to speculate about contraries and inquire whether the same science deals with contraries. For two things may be fairly ascribed to Socrates—inductive arguments and universal definition, both of which are concerned with the starting-point of science. But Socrates did not make the universals or the definitions exist apart; his successors, however, gave them separate existence, and this was the kind of thing they called Ideas.

Therefore it followed for them, almost by the same argument, that there must be Ideas of all things that are spoken of universally, and it was almost as if a man wished to count certain things, and while they were few thought he would not be able to count them, but made them more and then counted them; for the Forms are almost more numerous than the groups of sensible things, yet it was in seeking the causes of 1079a
sensible things that they proceeded from these to the Forms. For to each set of substances there answers a Form which has the same name and exists apart from the substances, and so also in the other categories[1] there is one character common to many individuals, whether these be sensible or eternal.

Again, of the ways in which it is proved that the Forms exist, none is convincing; for from some no inference necessarily follows, and from some it follows that there are Forms even of things of which the Platonists think there are no Forms.

For according to the arguments from the sciences there will be Forms of all things of which there are sciences, and according to the argument that there is one attribute common to many things there will be Forms even of negations, and according to the argument that thought has an object when the individual object has perished, there will be Forms of perishable things; for we can have an image of these. Again, of the most accurate arguments, some lead to Ideas of relations, of which the Platonists say there is no independent class, and others involve the difficulty of the 'third man'.[2] And in general the arguments for the Forms destroy that for whose existence the assertors of Forms are more anxious than

[1] 1079a 3 read *οὐσίας, τῶν τε ἄλλων.*
[2] Cf. K. 1059b 8 and Plato, *Parmenides*, 131 E.

for the existence of the Ideas; for it follows that not the dyad but number is first, and the relative is prior to the absolute[1]—and besides this there are all the other points on which certain people, by following out the opinions held about the Forms, have come into conflict with the principles of the theory.

Again, according to the assumption on which the belief in the Ideas rests, there will be Forms not only of substances but alsc of many other things; for the concept is single, not only in the case of substances, but also in that of non-substances, and there are sciences of other things than substance; and a thousand other such conclusions also follow. But according to the necessities of the case and the opinions about the Forms, if they can be shared in there must be Ideas of substances only. For they are not shared in incidentally, but each Form must be shared in as something not predicated of a subject. (E.g. if a thing shares in 'the double itself', it shares also in 'eternal', but incidentally; for 'the double' happens to be eternal.) Therefore the Forms will be substance. And the same names indicate substance in this and in the ideal world (or what will be the meaning of saying that there is something apart from the particulars—the one over many?).[2] And if the Ideas and the things that share in them have the same Form, there will be something common: for why should '2' be one[3] and the same in all the perishable 2's, or in the 2's which are many but eternal,[4] and not the same in the '2 itself' as in the individual 2? But if they have not the 1079^b same Form, they will have only the name in common, and it is as if one were to call both Callias and a piece of wood 'man', without observing any community between them.[5]

But if we are to suppose that in other respects the common formulae apply to the Forms, e.g. that 'plane figure' and

[1] i.e. number, which is relative, is prior to the dyad, which the ideal theory supposes to be absolute.

[2] This seems to be an enthymeme, the conclusion to be supplied being that the Forms, since they are substances, must be *of* substances.

[3] 1079^a 35 omit εἶναι.

[4] Sc. the abstract (eternal) 2's of which we can say e.g. $2 + 2 = 4$, i.e. τὰ μεταξύ, which like the Ideas are eternal, but like sensible things are many.

[5] With 1078^b 32–1079^b 3 cf. A. 990^a 34–991^a 8.

the other parts of the formula apply to the circle-in-itself, but the name of that of which it is the Form is to be added,[1] we must inquire whether this is not absolutely meaningless. For to what will this be added? To 'centre' or to 'plane' or to all the parts of the formula? For all the elements in the essence are Ideas, e.g. 'animal' and 'two-footed'. Further, the added notion must be an Idea, just as 'plane' must be a definite entity which will be present as genus in all its species.

CHAPTER V

Above all one might discuss the question what on earth the Forms contribute to sensible things, either to those that are eternal or to those which come into being and cease to be; for they cause neither movement nor any change in them. But again they help in no wise towards the *knowledge* of other things (for they are not even the substance of these, else they would have been in them), nor towards their being, at least if they are not *in* the individuals which share in them; though in that sense[2] white might be thought to cause[3] the whiteness of the white thing in which it is mixed. But this argument, which was used first by Anaxagoras, and later by Eudoxus in his discussion of difficulties and by certain others, is too easily upset; for it is easy to collect many insuperable objections to such a view.

But further all other things cannot come from the Forms in any of the ways that are usually suggested. And to say that they are patterns and the other things share in them is to use empty words and poetical metaphors. For what is it that works, looking to the Ideas? And any thing can both be and come into being[4] without being copied from something else, so that, whether Socrates exists or not, a man like Socrates might come to be. And evidently this might be so even if Socrates were eternal. And according to the Platonic prin-

[1] So that the definition of 'ideal circle' would be 'a plane figure whose circumference is at all points equidistant from the centre, and which is the Form of individual circles'.

[2] Sc. as present in the individual.

[3] 1079b 18 read *αἰτία δόξειεν ἂν εἶναι τὸ λευκόν.*

[4] 1079b 28 omit *ὅμοιον.*

ciples there will be several patterns of the same thing, and therefore several Forms, e.g. 'animal' and 'two-footed', and also 'man-himself', will be Forms of man. Again, the Forms are patterns not only of sensible things, but of things-in-themselves also, e.g. the genus is the pattern of the species of the genus; therefore the same thing will be pattern and copy.

Again, it might be thought impossible that substance and
1080a that whose substance it is should exist apart; how, therefore, could the Ideas, being substances of things, exist apart?

In the *Phaedo*[1] it is stated in this way—that the Forms are causes both of being and of becoming. Yet though the Forms exist, still things do not come into being, unless there is something to move them; and many other things come into being (e.g. a house or a ring), of which they say there are no Forms. Clearly therefore even the things of which they say there are Ideas can both be and come into being owing to such causes as produce the things just mentioned,[2] and not owing to the Forms. But regarding the Ideas it is possible, both in this way and by more abstract and more accurate arguments, to collect many objections like those we have considered.

CHAPTER VI

Since we have discussed these points, it is well to consider again the results regarding numbers which confront those who say that numbers are separable substances and first causes of things. If number is a real thing and its substance is nothing other than just number, as some say, it follows that either (1) there is a first[3] in it and a second, each being different in kind, and this is true of the units without qualification, and any unit is inaddible to any unit,[4] or (2) they are all directly successive, and any of them are addible to any, as they say is the case with mathematical number; for in mathematical number no unit is in any way different from another. Or

[1] 100 D. [2] With 1079b 12–1080a 8 cf. A. 991a 8–b 9.

[3] 1080a 17 read πρῶτόν τι.

[4] Aristotle begins ἤτοι . . . καὶ τοῦτο ἤ, as though the first main division were to be subdivided, and then he were to come to the second main division. But really the subdivisions of the first division cover the whole ground, and it is clearer to make simply four divisions.

(3) some units must be addible and some not, e.g. 2 is first after 1, and then comes 3 and then the other numbers, and the units in each number are addible, e.g. those in the first 2 are addible to one another, and those in the first 3 to one another, and so with the other numbers; but the units in the '2 itself' are not addible to those in the '3 itself'; and similarly in the case of the other successive numbers. Therefore while mathematical number is counted thus—after 1, 2 (which consists of another 1 besides the former 1), and 3 (which consists of another 1 besides these two), and the other numbers similarly, ideal number is counted thus—after 1, a distinct 2 which does not include the first 1, and a 3 which does not include the 2, and the other numbers similarly. Or (4) one kind of number is like the first that was named, one like that which the mathematicians speak of, and that which we have named last must be a third kind.

Again, these numbers must either be separable from things, or not separable but in sensible things (not however in the way which we first considered,[1] but in the sense that sensible things consist of numbers which are present in them)—either some of them and not others, or all of them.[2]

These are of necessity the only ways in which the numbers can exist. And of those who say that the 1 is the beginning and substance and element of all things, and that number is formed from the 1 and something else, almost every one has described number in one of these ways; only no one has said *all* the units are inaddible. And this has happened reasonably enough; for there can be no way besides those mentioned. Some say both kinds of number exist, that which has a before and after[3] being identical with the Ideas, and mathematical number being different from the Ideas and from sensible things, and both being separable from sensible things; and others say mathematical number alone exists, as the first of realities, separate from sensible things.

Now the Pythagoreans, also, believe in one kind of number—the mathematical; only they say it is not separate but

[1] Cf. 1076a 38–b 11.
[2] 1080b 3 read *αἰσθητά—ἢ τὸν μὲν αὐτῶν εἶναι τὸν δὲ μή ἢ πάντας εἶναι.*
[3] i.e. in which the numbers differ in kind.

sensible substances are formed out of it. For they construct the whole universe out of numbers—only not numbers consisting of abstract units; they suppose the units to have spatial magnitude. But how the first 1 was constructed so as to have magnitude, they seem unable to say.

Another thinker says the first kind of number, that of the Forms, alone exists, and some say mathematical number is identical with this.

The case of lines, planes, and solids is similar. For some think that those which are the objects of mathematics are different from those which come after the Ideas;[1] and of those who express themselves otherwise some speak of the objects of mathematics and in a mathematical way—viz. those who do not make the Ideas numbers nor say that Ideas exist; and others speak of the objects of mathematics, but not mathematically; for they say that neither is every spatial magnitude divisible into magnitudes, nor do any two units taken at random make 2. All who say the 1 is an element and principle of things suppose numbers to consist of abstract units, except the Pythagoreans; but *they* suppose the numbers to have magnitude, as has been said before. It is clear from this statement, then, in how many ways numbers may be described, and that all the ways have been mentioned; and all are impossible, but some perhaps more than others.

CHAPTER VII

First let us inquire if the units are addible or inaddible, and if 1081a inaddible, in which of the two ways we distinguished.[2] For it is possible that any unit is inaddible to any, and it is possible that those in the ideal 2 are inaddible to those in the ideal 3, and, generally, that those in each ideal number are inaddible to those in other ideal numbers. (1) If all units are addible and without difference, we get mathematical number and this alone, and the Ideas cannot be the numbers. For what sort of number will the ideal man or animal or any other Form be? There is one Idea of each thing, e.g. one of ideal man and another

[1] Cf. A. 992b 13-18.

[2] Cf. 1080a 18-20, 23-35.

one of ideal animal; but the similar and undifferentiated numbers are infinitely many, so that any particular 3 is no more the ideal man than any other 3. But if the Ideas are not numbers, neither can they exist at all. For from what principles will the Ideas come? *Number* comes from the 1 and the indefinite dyad, and the principles and the elements are said to be principles and elements of number, and the Ideas cannot be ranked as either prior or posterior to the numbers.

But (2) if the units are inaddible, and inaddible in the sense that none can be added to any other, number of this sort cannot be mathematical number; for mathematical number consists of undifferentiated units, and the truths proved of it suit this character. Nor can it be ideal number. For 2 will not come first after 1 and the indefinite dyad, and be followed directly by the successive numbers, as we say '2, 3, 4' (for the units in the ideal 2 are generated at the same time, whether, as the first holder of the theory said, from unequals—coming into being when these were equalized—or in some other way); since, if one unit is to be prior to the other, it will be prior to the 2 composed of these; for when there is one thing prior and another posterior, the compound of these will be prior to one and posterior to the other.[1]

Again, since the ideal 1 is first, and then there is a particular 1 which is first among the others and next after the ideal 1, and again a third which is next after the second and next but one after the first 1, the units must be prior to the numbers by which they are named in counting[2], e.g. there will be a third unit in 2 before 3 exists, and a fourth and a fifth in 3 before the numbers 4 and 5 exist.—None of these thinkers has said the units are inaddible in this way, but according to their principles even this way is reasonable, though in truth it is impossible. For it is reasonable that the units should have 1081^b priority and posteriority if there is a first unit and a first 1, and

[1] The theory of ideal number holds that 2 comes next after the original 1, which with the 'indefinite 2' is the source of number. But if all units are different in species, one of the units in 2 is prior to the other and ∴ to 2, and comes next after the original 1. Similarly between 2 and 3 there will be the first unit in 3, and so on. 1081^a 25 read ἐπεὶ εἰ.

[2] 1081^a 33 read λέγονται.

the 2's also if there is a first 2; for after the first it is reasonable and necessary that there should be a second, and if a second, a third, and so with the others successively. (And to say both at the same time, that a *unit* is first and another unit is second after the ideal 1, and that a 2 is first after it, is impossible.) But they make a first unit and 1, but not a second and a third, and a first 2, but not a second and a third.

Clearly, also, it is not possible, if all the units are inaddible, that there should be an ideal 2 and 3; and similarly in the case of the other numbers. For whether the units are undifferentiated or each differs from each, number must be counted by addition, e.g. 2 by adding another one to the one, 3 by adding another one to the two, and 4 similarly. This being so, numbers cannot be generated, as they generate them, from the dyad and the 1; for 2 becomes part of 3, and 3 of 4, and the same happens in the case of the succeeding numbers, but *they* say 4 came from the first 2 and the indefinite 2,—which makes it two 2's *other* than the ideal 2[1]; if not, the ideal 2[2] will be a part of 4 and one other 2 will be added. And similarly 2 will consist of the ideal 1 and another 1; but if this is so, the other element cannot be an indefinite 2; for it generates one unit, but not, as the indefinite 2 does, a definite 2. Again, besides the ideal 3 and the ideal 2 how can there be other 3's and 2's? And how do they consist of prior and posterior units? All these doctrines are mere fiction, and there cannot be a first 2 and then an ideal 3. Yet there must, if the 1 and the indefinite dyad are to be the elements. But if the results are impossible, it is also impossible that these are the generating principles.

If the units, then, are differentiated, each from each, these results and others similar to these follow of necessity. But (3) if those in different numbers are differentiated, but those in the same number are alone undifferentiated from one another,
1082^{a} even so the difficulties that follow are no less. E.g. in the ideal 10 there are ten units, and the 10 is composed both of them and of two 5's. But since the ideal 10[3] is not any

[1] The indefinite 2 being δυοποιός produces two 2's by operating on the ideal 2, and it is these two 2's which are distinct from the ideal 2.

[2] 1081^{b} 23 read αὑτή.

[3] 1082^{a} 3 read αὑτή.

chance number nor composed of any chance 5's—or, for that matter, units—the units in this 10 must differ. For if they do not differ, neither will the 5's of which the 10 consists differ; but since they differ, the units also will differ. But if they differ, will there be no other 5's in the 10 but only these two, or will there be others? If there are not, this is paradoxical; and if there are, what sort of 10 will consist of them? For there is no other 10 in *the* 10 but itself. But it is also necessary that the 4 should not consist of any chance 2's; for the indefinite 2, as they say, took the definite 2 and made two 2's; for its nature was to double what it took.

Again, as to the 2 being a thing apart from the two units, and the 3 a thing apart from the three units, how is this possible? Either by one's sharing in the other[1], as 'white man' is different from 'white' and 'man' (for it shares in these), or when one is a differentia of the other, as 'man' is different from 'animal' and 'two-footed'. Again, some things are one by contact, some by intermixture, some by position; none of which relations can belong to the units of which the 2 or the 3 consists; but as two men are not a unity apart from both, so must it be with the units. And their being indivisible will make no difference to them; for points are indivisible, but yet a pair of them is nothing apart from the two.

But this consequence also we must not forget, that it follows that there are prior and posterior 2's, and similarly with the other numbers. For let the 2's in the 4 be simultaneous; yet these are prior to those in the 8, and as the 2 generated them, they generated the 4's in the ideal 8. Therefore if the first 2 is an Idea, these 2's also will be Ideas. And the same account applies to the units; for the units in the first 2 generate the four in 4, so that all the units come to be Ideas and an Idea will be composed of Ideas. Clearly therefore those things also, of which these are Ideas, will be composite, e. g. one might say that animals are composed of animals, if there are Ideas of them. 1082b

In general, to differentiate the units in any way is an absurd fiction; and by a fiction I mean that which is brought in forcibly to suit a hypothesis. For neither in quantity nor in

[1] 1082a 17 read θατέρου θατέρου.

quality do we see unit differing from unit, and number must be either equal or unequal—all number but especially that which consists of abstract units—so that if one number is neither greater nor less than another, it is equal; but what is equal and in no wise differentiated we take to be the same when we are speaking of numbers. If not, even the 2's in this ideal 10 will be differentiated though they are equal; for what reason will the man who says they are not differentiated be able to allege?

Again, if every unit + another unit makes two, a unit from the ideal 2 and one from the ideal 3 will make a 2. Now this consists of differentiated units; and will it be prior to the 3 or posterior? It rather seems that it must be prior; for one of the units is simultaneous with the 3, and the other is simultaneous with the 2. And we, for our part, suppose that in general 1 and 1, whether the things are equal or unequal, is 2, e.g. the good and the bad, or a man and a horse; but those who hold these views say that not even two *units* are 2.

If the number of the ideal 3 is not greater than that of the 2, this is surprising; and if it is, clearly there is a number in it equal to the 2, so that this is not different from the ideal 2. But this is not possible, if there is a first and a second number.[1] Nor will the Ideas be numbers. For in this particular point they are right who claim that the units must be different, if there are to be Ideas, as has been said before. For the Form is unique; but if the units are not different, the 2's and the 3's also will not be different. Therefore they must say that when we count thus—'1, 2,' we do not add to the previous number; for if we do, neither will the numbers be generated from the indefinite dyad, nor can a number be an Idea; for one Idea will be in another, and all the Forms will be parts of one Form. Therefore with a view to their hypothesis they are right, but absolutely they are wrong; for their view is very destructive, since they will admit that this question itself affords some difficulty—whether, when we count and say '1, 2, 3,' we count by addition or by partitions.[2] But we do

[1] i.e. if there is a difference of kind between the numbers.
[2] i.e. (as Alexander explains) by starting with the notion of 10, and

both; therefore it is absurd to infer from this so great a difference of essence.

CHAPTER VIII

First of all it is well to determine what is the differentia of 1083a
a number—and of a unit, if it has a differentia. Units must differ either in quantity or in quality; and neither of these seems to be possible.[1] But number *qua* number differs in quantity. And if the units also differed in quantity, number would differ from number, though equal in number of units. Again, are the first units greater or smaller, and do the later ones increase or diminish? All these are irrational suppositions. But neither can they differ in quality. For no attribute can attach to them; for even to numbers quality is said to belong *after* quantity. Again, quality could not come to them either from the 1 or from the dyad; for the former has no quality, and the latter gives *quantity*; for its nature is what makes things to be many. If the facts are really otherwise, they should above all state this at the beginning and determine if possible, regarding the differentia of the unit, why it must exist, and, failing this, what differentia they mean.

Evidently then, if the Ideas are numbers, the units cannot all be addible, nor can they be inaddible in either of the two ways.[2] But neither is the way in which some others speak about numbers correct. These are those who do not think there are Ideas, either without qualification or as identified with certain numbers, but think the objects of mathematics exist and the numbers are the first of real things, and the ideal 1 is the starting-point of them. It is paradoxical that there should be a 1 which is first of 1's, as they say, but not a 2 which is first of 2's, nor a 3 of 3's; for the same reasoning applies to all. If, then, the facts with regard to number are so, and one supposes mathematical number alone to exist, the 1 is not the starting-point. For this sort of 1 must differ from the other units; and if this is so, there must also be a 2 which is first of 2's, and similarly with the other

taking 1, 2, 3, &c., successively, as parts of it. Or the meaning may be simply 'by splitting up a whole into its parts'.

[1] 1083a 4 read ὑπάρχειν.

[2] Cf. 1080a 18-20, 23-35.

successive numbers. But if the 1 is the starting-point, the truth about the numbers must rather be what Plato used to say, and there must be a first 2 and 3, and the numbers must not be addible to one another. But if on the other hand one supposes this, many impossible results, as we have said, follow. But either this or the other must be the case, so that if neither is, number cannot exist separately.

1083b It is evident from this that the third view[1] is the worst,—that ideal and mathematical number is the same. For two mistakes evidently meet in the one opinion. (1) Mathematical number cannot be of this sort, but the holder of this view has to spin it out by making suppositions peculiar to himself. And (2) he must also admit all the consequences that confront those who speak of number in the sense of 'Forms'.

The doctrine of the Pythagoreans in one way affords fewer difficulties than those before named, but in another way has others peculiar to itself. For not thinking of number as capable of existing separately removes many of the impossible consequences; but that bodies should be composed of numbers, and that this should be mathematical number, is impossible. For it is not true to speak of indivisible spatial magnitudes; and however much there might be magnitudes of this sort, units at least have not magnitude; and how can a magnitude be composed of indivisibles? But arithmetical number, at least, consists of abstract units, while these thinkers identify number with real things; at any rate they apply their propositions to bodies as if they consisted of those numbers.

If then it is necessary, if number is a self-subsistent real thing, that it should be conceived in one of these ways which have been mentioned, and if it cannot be conceived in any of these, evidently number has no such nature as those who make it separable construct for it.

Again, does each unit come from the great and the small, equalized, or one from the small, another from the great? (1) If the latter, neither does each thing contain all the elements, nor are the units without difference; for in one there is the great and in another the small, which is contrary in its nature to the great. Again, how is it with the units in the

[1] Cf. 1080b 22.

ideal 3? There is one over. But perhaps it is for this reason that they give the ideal 1 the middle place in odd numbers.[1] (2) But if each of the two units consists of both the great and the small, equalized, how will the 2, which is one thing, consist of the great and the small? Or how will it differ from the unit? Again, the unit is prior to the 2; for when it is destroyed the 2 is destroyed. It must, then, be the Idea of an Idea since it is prior to an Idea, and it must have come into being before it. From what, then? Not from the indefinite dyad, for *its* function was to double.

Again, number must be either infinite or finite; for these thinkers think of number as capable of existing separately, so that it is not possible that neither of those alternatives should be true. Clearly it cannot be *infinite*; for infinite number is 1084a
neither odd nor even, but the generation of numbers is always the generation either of an odd or of an even number,—when 1 operates in one way[2] on an even number, an odd number is produced, and when 2 (or an odd number) operates in the other way,[3] the numbers got from 1 by doubling (or the other even numbers) are produced. Again, if every Idea is an Idea of something, and the numbers are Ideas, infinite number will be an Idea of something, either of some sensible thing or of something else. Yet this is not possible in view of their hypothesis any more than it is reasonable in itself, if they conceive[4] of the Ideas as they do.

But if number is *finite*, how far does it go? With regard to this not only the fact but the reason should be stated. But if number goes only up to 10, as some say, firstly the Forms will soon run short; e.g. if 3 is man-in-himself, what number will be the horse-in-itself? The numbers which are Ideas of the several things go up to 10. It must, then, be one of the numbers within these limits; for it is these that are substances and Ideas. Yet they will run short; for the various forms of animal will exceed them. At the same time it is clear that if in this way *the* 3 is the Idea of man, the other 3's are so also (for those in the same number are similar), so that there will be

[1] Cf. Diels, *Vorsokratiker*, ed. 2, p. 270, § 2.
[2] Sc. addition. [3] Sc. multiplication.
[4] 1084a 10 read τάττουσί γ'.

an infinite number of men, and if each 3 is an Idea, each of the men will be man-in-himself, and if not, they will at least be men. And if the smaller number is part of the greater (being number of such a sort that the units in the same number are addible), then if the ideal 4 is an Idea of something, e.g. of 'horse' or of 'white', man will be a part of horse, if man is 2. It is paradoxical also that there should be an Idea of 10, but not of 11, nor of the succeeding numbers. Again, there both are and come to be certain things of which there are no Forms; why, then, are there not Forms of them also? We infer that the Forms are not causes. Again, it is paradoxical if the number-series up to 10 is more of a real thing and a Form [1] than 10 itself. There is no generation of the former as one thing, and there is of the latter. But they try to form a theory on the assumption that the series of numbers up to 10 is a complete series. At least they generate the derivatives—the void, proportion, the odd, and the others of this kind—within the decade. For some things, e.g. movement, rest, good, bad, they assign to the principles, and the others to the numbers. This is why they identify 1 with the odd; for if the odd implied 3, how would 5 be odd? [2] Again, spatial magnitudes and all such things are explained without going beyond a
1084b definite number, e.g. first comes [3] the indivisible line,[4] then the 2, then the others up to 10.[5]

Again, if number can exist separately, one might ask which is prior—1, or a number such as 2 or 3? Inasmuch as the number is composite, 1 is prior, but inasmuch as the universal and the form is prior, the number is prior; for each of the units is part of the number as its matter, and the number acts as form. And in a sense the right angle is prior to the acute, because it is definite and in virtue of its explanatory formula; but in a sense the acute is prior, because it is a part and the right angle is divided into acute angles. As matter, then, the acute angle and the element and the unit are prior, but as

[1] 1084a 29 read ὁ ἀριθμὸς ὁ μέχρι τῆς δεκάδος μᾶλλόν τι ὂν καὶ εἶδος.

[2] i.e. to account for the oddness of odd numbers they identify the odd with the 1, which is a principle present in all numbers, not with the 3, which on their theory is not present in other numbers.

[3] 1084b 1 omit ἡ.

[4] Cf. A. 992a 22.

[5] Cf. N. 1090b 21–24. 1 answers to the point (the 'indivisible line'), 2 to the line, 3 to the plane, 4 to the solid, and 1 + 2 + 3 + 4 = 10.

regards the form and the substance (in the sense of 'the formula'), the right angle, and the whole consisting of the matter and the form, are prior; for the concrete thing is nearer the form and the object formulated, but in generation it is later. How then is 1 the starting-point? Because it is not divisible, they say. But both the universal, and the particular or the element, are indivisible; but in different ways, one in formula and the other in time. In which way then is 1 the starting-point? As has been said, the right angle is thought to be prior to the acute, and the acute to the right, and each is one. They make 1 the starting-point in both ways. But this is impossible. For one kind of starting-point is the form or substance, the other the part or matter. For each of the 1's in 2 exists in a sense; in truth it exists potentially (at least if the number is a unity and not like a heap, i.e. if different numbers consist of differentiated units, as they say), but not actually.

The cause of the mistake they fell into is that they conducted their inquiry at the same time from the standpoint of mathematics and from that of universal formulae, so that (1) from the former standpoint they treated unity, their first principle, as a point; for the unit is a point without position. They put things together out of the smallest parts, as some others[1] have done. Therefore the unit becomes the matter of numbers and at the same time prior to 2; and again posterior, 2 being treated as a whole, a unity, and a form. But (2) because their inquiry was universal they treated the unity which can be predicated of a number, as in this sense also[2] a part of the number. But these characteristics cannot belong at the same time to the same thing.

If the ideal 1 must only fulfil this condition, that it is without a place in any particular number (for it differs in nothing from other 1's except that it is the starting-point), and the 2 is divisible but the unit is not, the unit must be liker the ideal 1 than the 2 is. But if the unit is liker it, *it* must be liker to the unit than to the 2; therefore each of the

[1] Sc. the atomists.
[2] i.e. they treated the unity which is predicable of a number, as well as the unit in a number, as a part of the number.

units in 2 must be prior to the 2. But they deny this; at 1085a least they generate the 2 first. Again, if the ideal 2 is a unity and the ideal 3 is one also, both form a 2. From what, then, is this 2 produced?

CHAPTER IX

Since there is not contact in numbers, but the units between which there is nothing, e. g. those in 2 or in 3, are successive, one might ask whether they succeed the ideal 1 or not, and whether, of the terms that succeed it, 2 or either of the units in 2 is prior.

Similar difficulties occur with regard to the classes of things posterior to number,—the line, the plane, and the solid. For some construct these out of the species of 'great and small'; e. g. lines from 'long and short', planes from 'broad and narrow', masses from 'deep and shallow'; which are species of 'great and small'. And the principle of the geometrical forms which answers to the 1 [1] different Platonists describe in different ways. And in these also the impossibilities, the fictions, and the contradictions of all probability are seen to be innumerable. For (1) the geometrical forms are severed from one another, unless the principles of these imply one another in such a way that the 'broad and narrow' is also 'long and short'; but if this is so, the plane will be a line and the solid a plane.[2] Again, how will angles and figures and such things be explained? And (2) the same happens as in regard to number; for 'long and short', &c., are attributes of magnitude, but magnitude does not *consist* of these, any more than the line consists of 'straight and curved', or solids of 'smooth and rough'.[3]

All these cases share a difficulty which occurs with regard to species of a genus, when one posits the universals, viz. whether it is the ideal animal or something other than the ideal animal that is in animals. True, if the universal is not separable, this will present no difficulty; but if the 1 and the

[1] i. e. that which is to the geometrical forms as the primary 1 is (according to the Platonic theory) to numbers.

[2] With 1085a 7–19 cf. A. 992a 10–19.

[3] Cf. A. 992b 1–6, N. 1088a 15–21.

numbers are separable, as those who express these views say, it is not easy to solve the difficulty, if one may call the impossible 'not easy'. For when we apprehend the unity in 2, or in general in a number, do we apprehend a thing-in-itself or something else?[1]

Some, then, generate spatial magnitudes from matter of this sort, others from the point—and the point is thought by them to be not 1 but something like 1—and from other matter like plurality, but not identical with it; about which principles none the less the same difficulties occur. For if the matter is one, line and plane and solid will be the same; for from the same elements will come one and the same thing. But if the matters are more than one, and there is one for the line 1085b
and a second for the plane and another for the solid, they either imply one another or not, so that the same results will follow even so; for either the plane will not contain a line or it will be a line.

Again, how number can consist of the one and plurality, they make no attempt to explain; at least as they state the case, the same objections arise as confront those who construct number out of the one and the indefinite dyad. For the one view generates number from the universally predicated plurality, and not from a particular plurality; and the other generates it from a particular plurality, but the first; for 2 is said to be a 'first plurality'. Therefore there is practically no difference, but the same difficulties will follow, —is it intermixture or position or fusion or generation? and so on. Above all one might press the question, if each unit is one, what does it come from? Certainly each is not the one-in-itself. It must, then, come from the one-in-itself and plurality, or a part of plurality. To say that the unit is a plurality is impossible, for it is indivisible; and to generate it from a part of plurality involves many other objections; for (1) each of the parts must be indivisible (or it will be a plurality and the unit will be divisible) and the elements will not be the one and *plurality*; for the single units do not come from plurality and the one. Again, (2) the holder of this view does nothing but presuppose another number; for his plurality of

[1] 1085a 31 read νοεῖ τι ἢ ἕτερον;

indivisibles is a number. Again, (3) we must inquire, in view of this theory also,[1] whether the number is infinite or finite. For there was at first, as it seems, a finite[2] plurality, from which and from the one comes the finite number of units. And plurality in itself is different from infinite plurality; what sort of plurality, then, is the element which co-operates with the one?

One might inquire similarly about the point, i.e. the element out of which they make spatial magnitudes. For surely this is not the one and only point; at any rate, then, let them say out of what each of the other points is formed. Certainly not of some *distance* + the point-in-itself. Nor again can *parts* of a distance be indivisible parts, as the parts of plurality out of which the units are said to be made are indivisible; for number consists of indivisibles, but spatial magnitudes do not.[3]

All these objections and others of the sort make it evident that number and spatial magnitudes cannot exist apart from things. Again, the fact that the chief thinkers disagree about 1086a numbers is a sign that it is the incorrectness of the alleged facts themselves that brings confusion into the theories. For those who make the objects of mathematics alone exist apart from sensible things, seeing the difficulty about the Forms and their fictitiousness, abandoned ideal number and posited mathematical. But those who wished to make the Forms at the same time numbers, but did not see, if one assumed these principles[4], how mathematical number was to exist apart from ideal, made ideal and mathematical number the same—in *name*, since in *fact* mathematical number is destroyed; for they state hypotheses peculiar to themselves and not those of mathematics. But he who first supposed that the Forms exist and that the Forms are numbers and that the objects of mathematics exist, naturally separated the two. Therefore it turns out that all of them are right in some respect, but on the whole not right. And they themselves

[1] Cf. 1083b 36.

[2] 1085b 24 omit καί.

[3] The point cannot have for an element of it (*a*) a distance, for this would destroy the simplicity of the point; or (*b*) part of a distance, for the part of a distance must be a distance.

[4] 1086a 7 read ταύτας.

confirm this, for their statements conflict. The cause is that their hypotheses and their principles are false. And it is hard to make a good case out of bad materials, according to Epicharmus[1]: 'as soon as 'tis said, 'tis seen to be wrong.' But regarding numbers the questions we have raised and the conclusions we have reached are sufficient; for he who is already convinced might be further convinced by a longer discussion, but one not yet convinced[2] would not come any nearer to conviction.

But regarding the first principles and the primary causes and elements, the views expressed by those who discuss only sensible substance have been partly stated in our works on nature,[3] and partly do not belong to the present inquiry; but the views of those who say there are other substances besides the sensible must be discussed next after those we have been mentioning. Since, then, some say that the Ideas and the numbers are such substances, and that the elements of these are elements and principles of real things, we must inquire regarding these what they say and in what sense they say it.

Those who posit numbers only, and these mathematical, must be considered later[4]; but as regards those who believe in the Ideas one might survey at the same time their way of thinking and the difficulties into which they fall. For they at the same time treat the Ideas as universal substances, and again as separable and individual. That this is not possible has been shown before.[5] The reason why those who say the Ideas are universal combined these two views in one, is that they did not make the Ideas substances identical with sensible things. They thought that the sensible particulars were in a state of flux and none of them remained, but 1086[b]
that the universal was apart from these and different. And Socrates gave the impulse to this theory, as we said before,[6] by means of his definitions, but he did not *separate* them from the particulars; and in this he thought rightly, in not separating them. This is plain from the results; for without the universal

[1] Fr. 14, Diels, *Vorsokratiker*.
[2] 1086[a] 20 read μὴ πεπεισμένος.
[3] *Phys*. i. 4-6, ii. 3; *De Caelo*, iii. 3, 4; *De Gen. et Corr*. i. 1, ii. 5.
[4] N. 1090[a] 7-15, 25-30, 35-[b] 20.
[5] B. 1003[a] 5-17, M. 4, 5.
[6] M. 4.

it is not possible to get knowledge, but the separation is the cause of the objections that arise with regard to the Ideas. His successors, treating it as necessary, if there are to be substances besides the sensible and transient substances, that they must be separable, had no others, but gave separate existence to these universally predicated substances, so that it followed that universals and individuals were almost the same sort of thing. This in itself, then, would be one difficulty in the view we have mentioned.

CHAPTER X

Let us now mention a point which presents a certain difficulty both to those who believe in the Ideas and to those who do not, and which was stated at the beginning among the problems.[1] If we do not suppose substances to be separate, and in the way in which particular things are said to be separate, we shall destroy that sort of substance which we wish to maintain; but if we conceive substances to be separable, how are we to conceive their elements and their principles?

If they are individual and not universal, (1) real things will be just of the same number as the elements, and (2) the elements will not be knowable. For (1) let the syllables in speech be substances, and their elements elements of substances; then there must be only one *ba* and one of each of the syllables, if they are not universal and the same in form but each is one in number and a 'this' and not merely possessed of a common name (and again they suppose each thing-in-itself to be one[2]). And if the syllables are unique, so are the parts of which they consist; there will not, then, be more *a*'s than one, nor more than one of any of the other elements, on the same principle on which none of the other syllables can exist in the plural number. But if this is so, there will not be other things existing besides the elements, but only the elements. (2) Again, the elements will not be even knowable; for they are not universal, and knowledge is of universals. This is clear

[1] B. 999b 24, 1003a 5.
[2] This gives a further reason why each element must be a single individual.

both from demonstrations and from definitions; for we do not conclude that this triangle has its angles equal to two right angles, unless every triangle has its angles equal to two right angles, nor that this man is an animal, unless every man is an animal.

But if the principles are universal either the substances composed of them are universal, or[1] non-substance will be 1087a prior to substance; for the universal is not a substance, and the element or principle is universal, and the element or principle is prior to the things of which it is the principle or element.

All these difficulties follow naturally, when they make the Ideas out of elements and at the same time claim that Ideas should be separate unities, apart from the substances which have the same form. But if, e.g., in the case of the elements of speech, the *a*'s and the *b*'s may quite well be many and there need be no ideal *a* and ideal *b* besides the many, there may be, as far as this goes, an infinite number of similar syllables. The statement that all knowledge is universal, so that the principles of things must also be universal and not separate substances, presents indeed, of all the points we have mentioned, the greatest difficulty, but yet the statement is in a sense true, although in a sense it is not. For knowledge, like the verb 'to know', means two things, of which one is potential and one actual. The potency, being, as matter, universal and indefinite, deals with the universal and indefinite; but the actuality, being definite, deals with a definite object,—being a 'this', it deals with a 'this'. But *per accidens* sight sees universal colour, because this individual colour which it sees is colour; and this individual *a* which the grammarian investigates is an *a*. For if the principles must be universal, what is derived from them must also be universal, as in demonstrations[2]; and if this is so, there will be nothing capable of separate existence—i. e. no substance. But evidently in a sense knowledge is universal, and in a sense it is not.

[1] 1087a 1 read καθόλου, ἢ ἔσται.
[2] Sc. universal premises cannot give singular conclusions.

BOOK XIV (N)

CHAPTER I

REGARDING this kind of substance, what we have said must be taken as sufficient. All philosophers make the first principles contraries: as in natural things, so also in the case of unchangeable substances. But since there cannot be anything prior to the first principle of all things, the principle cannot be the principle and yet be an attribute of something else. To suggest this is like saying that the white is the first principle, not *qua* anything else but *qua* white, but yet that it is predicable of a subject, i.e. has whiteness as an attribute of something else; this is absurd, for then that subject will be prior. But all things which are generated from their contraries involve an underlying subject; a subject, then, must be
1087b present in the case of contraries, if anywhere. All contraries, then, are always predicable of a subject, and none can exist apart. But appearances suggest that there is nothing contrary to substance, and argument confirms this. No contrary, then, is the first principle of all things in the full sense; the first principle is something different.

But these thinkers make one of the contraries matter, some making the unequal—which they take to be the essence of plurality—matter for the one, which is the equal, and others making plurality matter for the one. (The former generate numbers out of the dyad of the unequal, i. e. of the great and small, and the other thinker we have referred to generates them out of plurality, while according to both it is generated *by* the essence of the one.) For even the philosopher who says the unequal and one are the elements, and the unequal is a dyad composed of the great and small, treats the unequal, or the great and the small, as being one, and does not draw the distinction that they are one in formula, but not in number. But they do not describe rightly even the principles which they call elements, for some name the great and the small

with the one and treat these three as elements of numbers, two being matter, one form; while others name the many and few, because the great and the small are more appropriate in their nature to magnitude than to number; and others name rather the universal character common to these—'that which exceeds and that which is exceeded'. None of these varieties of opinion makes any difference to speak of, in view of some of the consequences; they affect only the abstract objections, which these thinkers take care to avoid because their own demonstrations are abstract,—with this exception, that if the exceeding and the exceeded are the principles, and not the great and the small, consistency requires that number should come from the elements before 2 does; for number is more universal than 2, as the exceeding and exceeded are more universal than the great and small. But as it is, they say one of these things but do not say the other. Others oppose the different and the other to the one, and others oppose plurality to the one. But if, as they claim, things consist of contraries, and to the one either there is nothing contrary, or if there must be something it is plurality, and the unequal is contrary to the equal and the different to the same and the other to the thing itself, those who oppose the one to plurality have most claim to plausibility, but even their view is inadequate, for the one would on their view be a few; for plurality is opposed to fewness, and the many to the few.

'The one' evidently means a measure[1]. And in every case it is some underlying thing with a distinct nature of its own, e.g. in the scale a quarter-tone, in spatial magnitude a finger or a foot or something of the sort, in rhythms a beat or a syllable; and similarly in gravity it is a definite weight; and in the same way in all cases, in qualities a quality, in 1088a
quantities a quantity (and the measure is indivisible, in the former case in kind, and in the latter to the sense); which implies that the one is not, in any instance, in itself a substance. And this is reasonable; for 'the one' means the measure of some plurality, and 'number' means a measured plurality and a plurality of measures. Thus it is natural that one is not a number; for the measure is not measures, but

[1] i.e. a unit or standard.

both the measure and the one are starting-points. The measure must always be something predicable of all alike, e.g. if the things are horses, the measure is 'horse', and if they are men, 'man'[1]. If they are a man, a horse, and a god, the measure is perhaps 'living being', and the number of them will be a number of living beings. If the things are 'man' and 'white' and 'walking', these will scarcely have a number, because all belong to a subject which is one and the same in number, yet the number of these will be a number of 'classes', or of some equivalent term.

Those who treat the unequal as one thing, and the dyad as an indefinite compound of great and small, say what is very far from being probable or possible. For (1) these are modifications and accidents, rather than substrata, of numbers and magnitudes—the many and few of number, and the great and small of magnitude—like even and odd, smooth and rough, straight and curved. Again, (2) apart from this mistake, the great and the small, and the like, must be relative to something; but the relative is least of all things—of all the categories—a real thing or substance, and is posterior to quality and quantity; and the relative terms in question are accidents of quantity, as was said, but not its matter, since something with a distinct nature of its own must underlie both the relative in general and its parts and kinds. For there is nothing either great or small, many or few, or, in general, relative, which without having a nature of its own is many or few, great or small, or relative to something else. A sign that the relative is least of all a substance and a real thing is the fact that it alone has no proper generation or destruction or movement, as in quantity there is increase and diminution, in quality alteration, in place locomotion, in substance simple generation and destruction. The relative has no proper change; for, without changing, a thing will be now greater and now less or equal, if that with which it is compared has changed in
1088b quantity. And the matter of each thing, and therefore of substance, must be that which is potentially of the nature in question; but the relative is neither potentially nor actually substance. It is strange, then, or rather impossible, to make

[1] 1088a 9 read εἰ ἵπποι, τὸ μέτρον ἵππος, καὶ εἰ ἄνθρωποι, ἄνθρωπος.

not-substance an element in, and prior to, substance; for all the categories are posterior to substance. Again, (3) the elements are not predicated of the things of which they are elements, but many and few are predicated both apart and together of number, and long and short of the line, and both broad and narrow apply to the plane. If there is a plurality, then, of which the one term, viz. few, is always predicated,[1] e.g. 2 (which cannot be many, for if it were many, 1 would be few), there must be also one which is absolutely many, e.g. 10 is many (if there is no number which is greater than 10), or 10,000. How then, in view of this, can number consist of few and many? Either both ought to be predicated of it, or neither; but according to the present account only the one *or* the other is predicated.

CHAPTER II

We must inquire generally, whether eternal things can consist of elements. If they do, they will have matter; for everything that consists of elements is composite. Since, then, a thing must have come into being out of that of which it consists (even if, though it came into being, it exists for ever), and since everything comes to be what it comes to be out of that which is it potentially (for it could not have come to be out of that which had not this capacity, nor could it consist of such elements), and since the potential can be either actual or not,—this being so, however everlasting number or anything else that has matter is, it must be capable of not existing, just as that which is any number of years old is as capable of not existing as that which is a day old; if this is capable of not existing, so is that which has lasted for a time so long that it has no limit. They cannot, then, be eternal, since that which is capable of not existing is not eternal, as we had occasion to show in another context[2]. If that which we are now saying is true universally—that no substance is eternal unless it is actuality, and if the elements are matter that underlies

[1] 1088b 9 read *αἰεί, ὀλίγον* or perhaps *ὀλίγον αἰεί* or *αἰεί, τὸ ὀλίγον*, as Alexander seems to have done.
[2] Cf. Θ. 1050b 6, *De Caelo*, i. 12.

substance, no eternal substance can have elements present in it, of which it consists.

There are some who describe the element which acts with the one as the indefinite dyad, and object to 'the unequal', reasonably enough, because of the ensuing difficulties; but they have got rid only of those objections which inevitably arise from the treatment of the unequal, i.e. the relative, as an element; those which arise apart from this opinion must confront even these thinkers, whether it is ideal number, or mathematical, that they construct out of those elements.

There are many causes which led them off into these explanations, and especially the fact that they framed the
1089a difficulty in an obsolete form. For they thought that all things that are would be one—viz. Being itself, if one did not join issue with and refute the saying of Parmenides[1]:

'For never will this be proved[2], that things that are not are.'

They thought it necessary to prove that that which is not is; for only thus—of that which is *and something else*—could the things that are be composed, if they are many.

But firstly, if 'being' has many senses (for it means sometimes substance, sometimes quality, sometimes quantity, and at other times the other categories), what sort of 'one' are all the things that are, if non-being is to be supposed not to be? Is it the substances that are one, or the affections and all the other categories as well[3]—so that the 'this' and the 'such' and the 'so much' and the other categories that indicate each some class of being[4] will all be one? But it is strange, or rather impossible, that the calling into play of one thing[5] should bring it about that part of that which is is a 'this', part a 'such', part a 'so much', part 'in such and such a place'.

Secondly, of what sort of non-being and being do the things that are consist? For 'non-being' also has many senses, since 'being' has; and 'not man' means not being a certain substance, 'not straight' not being of a certain quality, 'not

[1] Fr. 7, Diels, *Vorsokratiker*.
[2] 1089a 3 read *τοῦτο δαμῇ*.
[3] 1089a 10 read *ὁμοίως ἅπαντα*.
[4] 1089a 11 read *ὅσα ὄν τι*.
[5] i. e. non-being.

three cubits long' not being of a certain quantity. What sort of being and non-being, then, by their union pluralize the things that are? This thinker means by the non-being, the union of which with being pluralizes the things that are, the false and the character of falsity.[1] This is also why it was said that we must assume something that is false, as geometers assume the line which is not a foot long to be a foot long. But this cannot be so. For neither do geometers assume anything false (for the proposition in question is extraneous to the inference), nor are the things that are generated from or resolved into non-being in this sense. But since 'non-being' in the various cases[2] has as many senses as there are categories, and besides this the false is said not to be and so is the potential, generation proceeds from the *latter*, man from that which is not man but potentially man, and white from that which is not white but potentially white, and this whether it is one thing that is generated or many.

The question evidently is, how being, in the sense of 'the *substances*', is many; for the things that are generated are numbers and lines and solids. It is strange to inquire how being in the sense of substance is many, and not how either qualities or quantities are many. For surely the indefinite dyad or the great and the small are not a reason why there should be two kinds of white or many colours or flavours or shapes; for then these also would be numbers and units. But if they had attacked this point, they would have seen the cause of the plurality in substances also; for the cause is the same or analogous. This aberration is the reason also why in seeking the opposite of being and the one, from which and being and the one the things that are proceed, they posited the relative term (i. e. the unequal), which is neither the contrary nor the contradictory of these, but is one kind of being as substance and quality are.

They should have inquired also how relative terms are many and not one. But as it is, they inquire how there are many units besides the first 1, but do not go on to inquire how there are many unequals besides *the* unequal. Yet they use them

[1] 1089a 20 read λέγειν. Cf. Pl. *Soph.* 237 A, 240.
[2] Cf. ll. 16–18.

and speak of great and small, many and few (from which proceed numbers), long and short (from which proceeds the line), broad and narrow (from which proceeds the plane), deep and shallow (from which proceed solids); and they speak of yet more kinds of relative term. What is the reason, then, why there is a plurality of these?

It is necessary, as we say, to presuppose for each thing that which is it potentially; and the holder of these views further declared what that is which is potentially a 'this' and a substance but is not in itself being—viz. that it is the relative (as if he had said 'the qualitative'), which is neither potentially the one or being, nor the contradictory of the one nor of being, but one among beings. And it was much more necessary, as we said, if he was inquiring how beings are many, not to inquire about those in the same category—how there are many substances or many qualities—but how beings as a whole are many; for some are substances, some modifications, some relations. In the categories other than substance there is another way of explaining how there can be plurality, viz. that, since they are not separable from substances, qualities and quantities are many only because their substrate becomes and is many. Yet there *ought* to be a matter for each category; only it cannot be separable from substances. But in the case of individual substances, it is possible to explain how the individual is many things, unless a thing is to be treated as both an individual and a general character[1]. The difficulty arising from these facts is rather this, how there are actually many substances and not one.

But further, if the 'this' and the quantitative are not the same, we are not told how and why the things that are are many, but how quantities are many. For all 'number' means a quantity, and the 'unit', unless it means merely a measure, means the indivisible in quantity. If then the quantitative
1090a and substance are different, we are not told whence or how substance is many; but if any one says they are the same, he has to face many inconsistencies.

One might fix one's attention also on the question, regarding

[1] Which, Aristotle thinks, the Platonists assert the Idea to be.

the numbers,—what justifies the belief that they exist. To the believer in the Ideas they provide a cause for existing things, since each number is an Idea, and the Idea is to other things somehow or other the cause of their being; for let this supposition be granted them. But as for him who does not hold this view because he sees the inherent objections to the Ideas (so that it is not for this reason that he posits numbers), but who posits *mathematical* number, why must we believe his statement that such number exists, and of what use is such number to other things? Neither does he who says it exists maintain that it is the cause of anything (he rather says it is a thing in itself), nor is it observed to be the cause of anything; for the theorems of arithmeticians will all be found true even of sensible things, as was said.[1]

CHAPTER III

Those who suppose the Ideas to exist and to be numbers, according to the theory which gives a separate existence to each, try at least to explain somehow why it is possible to assume that each is one thing apart from the many.[2] Since their reasons, however, are neither conclusive nor in themselves possible, one must not, on this account at least, assert the existence of number. But the Pythagoreans, because they saw many attributes of numbers belonging to sensible bodies, supposed real things to be numbers—not separable numbers, however, but numbers of which real things consist. But why? Because the attributes of numbers are present in a musical scale and in the heavens and in many other things.[3] But those who say that mathematical number alone exists cannot according to their hypotheses say anything of this sort; nay, they used to say that those applied numbers could not be the subject of the sciences. But we maintain that they are, as we said before.[4] And it is evident that the objects of mathematics do not exist apart; for if they existed apart

[1] Cf. M. 3.

[2] 1090a 17 read ἑκάστου, παρὰ τὰ πολλὰ λαμβάνειν τὸ ἕν τι ἕκαστον πειρῶνταί γε λέγειν πως διὰ τί ἐστιν.

[3] Cf. A. 989b 29–990a 29.

[4] Cf. M. 3.

their attributes would not have been present in bodies. The Pythagoreans in this point are open to no objection; but in that they construct natural bodies out of numbers, things that have lightness and weight out of things that have not weight or lightness, they seem to speak of another heaven and other bodies, not of the sensible. But those who make number separable assume that it exists and is separable because the axioms would not be true of sensible things, while the statements of mathematics *are* true and delight the soul; and similarly with the spatial magnitudes of
1090b mathematics. It is evident, then, both that our rival theory will say the contrary of this, and that the difficulty we raised just now, why if numbers are in no way present in sensible things their attributes are present in sensible things, is solved for those who hold our views.[1]

There are some who, because the point is the limit and extreme of the line, the line of the plane, and the plane of the solid, think there must be real things of this sort. We must therefore examine this argument too, and see whether it is not remarkably weak. For (1) extremes are not substances, but rather all these things are mere limits. For even walking, and movement in general, has a limit, so that on their theory this will be an individual and a substance. But that is absurd. (2) Even if they are substances, they will all be the substances of particular sensible things; for it is to these that the argument applied. Why then should they be capable of existing apart?

Again, if we are not too easily satisfied, we may, regarding all number and the objects of mathematics, press this difficulty, that they contribute nothing to one another, the prior to the posterior; for if number did not exist, none the less spatial magnitudes would exist for those who maintain the existence of the objects of mathematics only, and if spatial magnitudes did not exist, soul and sensible bodies would exist. But the observed facts show that nature is not a series of episodes, like a bad tragedy. The believers in the Ideas escape this difficulty; for they construct spatial magnitudes out of matter and number, lines out of 2, planes doubtless out of 3, solids

[1] 1090b 3 read λύεται.

out of 4, or they use other numbers, which makes no difference. But will these magnitudes be Ideas, or what is their manner of existence, and what do they contribute to things? These contribute nothing, as the objects of mathematics contribute nothing. But not even is any theorem true of them, unless we want to change the concepts of mathematics and invent doctrines of our own. But it is not hard to assume any random hypotheses and spin out a long string of conclusions. These thinkers, then, are wrong in this way, in wanting to unite the objects of mathematics with the Ideas.

And those who first posited two kinds of number, that of the Forms and the other which is mathematical, neither have said nor can say in the least how mathematical number is to exist and of what it is to consist. For they place it between ideal and sensible number. If (1) it consists of *the* great and small, it will be the same as the other—ideal number. But of what other[1] great and small than *the* great and small can it consist? For he[2] makes spatial magnitudes out of *one* other great and small.[3] And if (2) he names some 1091a
other element, he will be making his elements rather many. And if the principle of each of the two kinds of number is a 1, unity will be something common to these. And we must inquire how the one is these *many* things, while at the same time *number*, according to him, cannot be generated except from one *and the indefinite dyad.*

All this is absurd, and conflicts both with itself and with the probabilities, and we seem to see in it Simonides' 'long story'[4]; for the long story comes into play, like those which slaves tell, when men have nothing sound to say. And the very elements—the great and the small—seem to cry out against the violence that is done to them; for they cannot in any way generate numbers other than those got from 1 by doubling.

It is strange also to attribute generation to eternal things, or rather this is one of the things that are impossible. There need be no doubt whether the Pythagoreans attribute genera-

[1] 1090b 37 read ἐξ ἄλλου δὲ τίνος μικροῦ καὶ μεγάλου;
[2] Sc. Plato.
[3] Cf. 1090b 21, 22.
[4] Sim. Ceïus, Fr. 189, Bergk.

tion to them or not; for they obviously say that when the one had been constructed, whether out of planes or of surface or of seed or of elements which they cannot express, immediately the nearest part of the unlimited began to be constrained and limited by the limit. But since they are constructing a world and wish to speak the language of natural science, it is fair to make some examination of their physical theories, but to let them off from the present inquiry; for we are investigating the principles at work in *unchangeable* things, so that it is numbers of *this* kind whose genesis we must study.

CHAPTER IV

These thinkers say there is no generation of the odd number, which evidently implies that there *is* generation of the even; and some say the even is produced first from unequals—the great and the small—when these are equalized. The inequality, then, must belong to them *before* they are equalized. If they had always been equalized, they would not have been unequal before; for there is nothing before that which is always. Therefore evidently they are not giving their account of the generation of numbers merely as a logical account.[1]

A difficulty, and a reproach to any one who finds it *no* difficulty, are contained in the question how the elements and the principles are related to the good and the beautiful; the difficulty is this, whether any of the elements is such a thing as we mean by the good itself and the best, or this is not so, but these are later in origin than the elements. The mythologists seem to agree with some thinkers of the present day, who answer the question in the negative, and say that both the good and the beautiful appear in the nature of things only when that nature has made some progress. This they do to avoid a real objection which confronts those
1091b who say, as some do, that the one is a first principle. (The objection arises not from their ascribing goodness to the first principle as an attribute, but from their making the one

[1] Cf. *De Caelo*, i. 279b 32–280a 10.

a principle—and a principle in the sense of an element—and generating number from the one.) And the old poets agree with this inasmuch as they say that not those who are first in time, e.g. Night and Heaven or Chaos or Ocean, reign and rule, but Zeus.[1] These poets, however, speak thus only because they think of the rulers of the world as changing; for those of them who combine two characters in that they do not[2] use mythical language throughout, e.g. Pherecydes and some others, make the original generating agent the Best, and so do the Magi, and some of the later sages also, e.g. Empedocles and Anaxagoras, of whom one made friendship an element, and the other made reason a principle. Of those who maintain the existence of the unchangeable substances some say the one itself is the good itself; but they thought its substance lay mainly in its unity.

This, then, is the problem,—which of the two ways of speaking is right. It would be strange if to that which is primary and eternal and most self-sufficient this very quality—self-sufficiency and self-maintenance—belongs primarily in some other way than *as a good*. But indeed it can be for no other reason indestructible or self-sufficient than because its nature is good. Therefore to say that the first principle is good is probably correct; but that this principle should be the one or, if not that, an element, and an element of numbers, is impossible. Powerful objections arise, to avoid which some have given up the theory (viz. those who agree that the one is a first principle and element, but only of *mathematical* number). For on this view all the units become identical with species of good, and there is a great profusion of goods. Again, if the Forms are numbers, all the Forms are identical with species of good. But let a man assume Ideas of anything he pleases. If these are Ideas only of goods, the Ideas will not be substances; but if the Ideas are also Ideas of substances, all animals and plants and all individuals that share in Ideas will be good.

These absurdities follow, and it also follows that the contrary element, whether it is plurality or the unequal, i.e. the great and small, is the bad-itself. Hence one

[1] Cf. 1071b 26. [2] 1091b 8 omit *καί*.

thinker avoided attaching the good to the one, because it would necessarily follow, since generation is from contraries, that badness is the fundamental nature of plurality. Others say inequality is the nature of the bad; it follows, then, that all things partake of the bad except one—the one itself, and that numbers partake of it in a more undiluted form than 1092a spatial magnitudes, and that the bad is the space in which the good is realized, and that it partakes in and desires that which tends to destroy it; for contrary tends to destroy contrary. And if, as we said, the matter is that which is potentially each thing, e.g. that of actual fire is that which is potentially fire, the bad will be just the potentially good.

All these objections, then, follow, partly because they make every principle an element, partly because they make contraries principles, partly because they make the one a principle, partly because they treat the numbers as the first substances, and as capable of existing apart, and as Forms.

CHAPTER V

If, then, it is equally impossible not to put the good among first principles and to put it among them in this way, evidently the principles are not being correctly described, nor are the first substances. Nor do we conceive the matter correctly if we compare the principles of the universe to that of animal sand plants, on the ground that the more complete always comes from the indefinite but incomplete—which is what leads this thinker to say that this is also true of the first principles of reality, so that the one itself is not even an existing thing. This is incorrect, for even in this world of animals and plants the principles from which these come are complete; for it is a man that produces a man, and the seed is not first.

It is strange, also, to generate place simultaneously with the mathematical solids[1] (for place is peculiar to the individual things, and hence they are separable in place, but mathematical objects are nowhere), and to say that they must be somewhere, but not say what the place is.

Those who say that the things that are come from elements

[1] 1092a 18 read τοῖς στερεοῖς τοῖς μαθηματικοῖς.

and that the first of things that are are the numbers, should have first distinguished the senses in which one thing comes from another, and then said in which sense number comes from its elements.

By intermixture? But not everything is capable of intermixture, and that which is produced by it is different from its elements, and on this view the one will not remain separate or a distinct entity; but they want it to be so.

By juxtaposition, like a syllable? But then (1) the elements must have position; and (2) he who thinks of the one and plurality must think of them apart; number then will be this—a unit *and* plurality, or the one *and* the unequal.

Coming from certain things means in one sense that these are still to be found in the product and in another that they are not; in which sense does number come from these elements? Only things that are generated can come from elements which are present in them. Does number come from its elements as from seed? But nothing can be excreted from that which is indivisible. Does it come from its contrary, its contrary not persisting? But all things that come in this way come also from something else which does persist.[1] Since, then, one thinker places the 1 as contrary to plurality, and another places it as contrary to the unequal, treating the 1 as equal, number is treated as coming from 1092b
contraries. There will then be something else that persists, from which and from one contrary the compound is or has come to be. Again, why in the world do the other things that come from contraries, or that have contraries, perish (even when all of the contrary is used to produce them), while number does not? Nothing is said about this. Yet whether present or not present in the compound the contrary destroys it, e. g. 'strife' destroys the 'mixture'[2] (yet it should not; for it is not to that that it is contrary).

Once more, it has in no sense been determined in which way numbers are the causes of substances and of being—whether (1) as limits (as points are of spatial magnitudes). This is how Eurytus decided what was the number of what (e. g. of

[1] Cf. Λ. 1069b 3-9, *Phys.* i. 7.
[2] Cf. Empedocles, Fr. 17, Diels, *Vorsokratiker.*

man, or of horse), viz. by imitating the figures of living things[1] with pebbles, as some people bring numbers into the forms of triangle and square. Or (2) is it because harmony is a ratio of numbers, and so is man and everything else? But how are the attributes—white and sweet and hot—numbers? Evidently the numbers are not the essence[2] nor causes of the form; for the ratio is the essence, while the number is the matter. E.g. the essence of flesh or bone is number only in this way, 'three parts of fire and two of earth.'[3] And a number, whatever it is, is always a number of certain things, either of parts of fire or earth or of units; but the essence is that there is so much of one thing to so much of another in the mixture; and this is no longer a number but a ratio of mixture of numbers, whether these are corporeal or of any other kind.

Number, then, whether number in general or the number which consists of abstract units, is neither the cause as agent, nor the matter, nor the ratio and form of things. Nor, of course, is it the final cause.

CHAPTER VI

One might also raise the question what the good is that things get from numbers because their composition is expressible by a number, either by one which is easily calculable or by an odd number. For in fact honey-water is no more wholesome if it is mixed in the proportion of three times three, but it would do more good if it were in no particular ratio but well diluted than if it were numerically expressible but strong. Again, the ratios of mixtures are expressed by the *adding* of numbers, not by mere numbers, e.g. it is 'three parts to two', not 'three times two'. For the same genus must underlie things that are multiplied together; therefore the product $1 \times 2 \times 3$ must be measurable by 1, and $4 \times 5 \times 7$ by 4, and therefore all products into which the same factor enters must be measurable by that factor. The number of fire, then, cannot be $2 \times 5 \times 3 \times 7$, and at the same time that of water 2×3.

If all things must share in number, it must follow that many

[1] Eurytus may have used φυτά in this wider sense, as Plato sometimes does. The ordinary Aristotelian sense 'plants' would be difficult here.

[2] 1092b 17 read οὐσία.

[3] Cf. Empedocles, Fr. 96, Diels.

things are the same, and the same number must belong to one thing and to another. Is number the cause, then, and does the thing exist because of its number, or is this not certain? E.g. the motions of the sun have a number, and again those of the moon,—yes, and the life and prime of each animal. Why, then, should not some of these numbers be squares, some cubes, and some equal, others double? There is no reason why they should not, and indeed they must be comprised within these descriptions, since all things were assumed to share in number and things that differed might fall under the same number. Therefore if the same number had belonged to certain things, these would have been the same as one another, since they would have had the same form of number; e.g. sun and moon would have been the same. But why are these numbers causes? There are seven vowels, seven strings or scales, the Pleiades are seven, at seven animals lose their teeth (at least some, though some do not), and the champions who fought against Thebes were seven. Is it then because the number is what it is, that the champions were seven or the Pleias consists of seven stars? Surely the champions were seven because there were seven gates or for some other reason, and the Pleias *we* count as seven, as we count the Bear as twelve, while other peoples count more stars in both. Nay, they even say that *Ξ*, *Ψ*, and *Z* are concords, and because there are three concords, the double consonants also are three. They quite neglect the fact that there might be a thousand such letters; for one sign might be attached to *ΓΡ*. But if they say that each of these three is equal to two of the other letters, and no other is so, and if the cause is that there are three parts of the mouth and sigma is applied singly to each, it is for this reason that there are only three, not because the concords are three; since as a matter of fact the concords are more than three, but of double consonants there cannot be more. These people are like the old Homeric scholars, who see small resemblances but neglect great ones. Some say that there are many[1] such cases, e.g. that the middle strings are represented by nine and eight[2], and that the epic verse has seventeen

[1] 1093^a 28 read τινὲς ὅτι πολλά.

[2] The ratios corresponding to the fourth and the fifth are respectively 8 to 6 and 9 to 6.

syllables, which is equal in number to the two strings; and the scansion is, in the right half of the line nine syllables, and 1093b in the left eight. And they say that the distance in the letters from alpha to omega is equal to that from the lowest note of the flute to the highest[1], and that the number of this note is equal to that of the whole system of the heavens. We must observe that no one could find difficulty either in stating such analogies or in finding them in eternal things, since they can be found even in perishable things.

But the lauded characteristics of numbers and their contraries, and generally the mathematical relations, if we view them as some do, making them causes of nature, seem to escape us; for none of them is a cause in any of the senses that have been distinguished in reference to the first principles.[2] Yet if mathematical objects be conceived as these thinkers conceive them, evidently goodness is predicable of them, and the odd, the straight, the equal, the potencies of certain numbers, are in the catalogue[3] of the beautiful. For the seasons and a particular number go together; and the other agreements that they collect from the theorems of mathematics all have this meaning.[4] Hence they are like coincidences. For they are accidents, but the things that agree are appropriate to one another, and one by analogy. For in each category of being an analogous term is found—as the straight line is in length, so is the plane in surface, perhaps the odd in number, and the white in colour.

Again, it is not the *ideal* numbers that are the causes of musical phenomena and the like (for equal ideal numbers differ from one another in form; for even the units do); so that we need not assume Ideas for this reason at least.

These, then, are the results of the theory, and yet more might be brought together. The fact that our opponents have much trouble with the generation of ideal numbers and can in no way make a system of them, seems to indicate that the objects of mathematics are not separable from sensible things, as some say, and that they are not the first principles.

[1] 1093b 3 omit νεάτην. So perhaps Alexander.
[2] Cf. Δ. 1, 2.
[3] Cf. note on A. 986a 23.
[4] Sc. that numerical relations are found in things, but are not the *cause* of anything that happens.

INDEX

0^a—93^b = 1000^a—1093^b

α privative, its meanings 22^b 32.

Abstraction 36^b 3, 23, 61^a 29;)(qualification 982^a 27, 30^a 33, 77^b 10.

Accident, accidental Δ. 30, E. 2, 3, K. 8, 7^a 15, 22–^{b} 16, 13^b 34–14^a 21, 15^b 17, 17^a 7, 27^b 33; not knowable 26^b 3, 64^b 30, 65^a 4; its cause matter 27^a 13; twofold 31^b 22; the same by accident 37^b 6; nothing accidentally perishable 59^a 1;)(essential 65^a 6.

Action, concerned with individuals 981^a 17;)(motion 48^b 18.

Actuality (ἐνέργεια) Θ. 6–9, K. 9;)(potency 3^a 1, 7^b 28, 69^b 16, 71^a 6, ^{b} 22; coni. substance, form, definition, essence 42^b 10, 43^a 18, 25, 28, 31, 50^a 16, ^{b} 2, 51^b 31, 71^a 8;)(matter 43^a 6, 45^a 35, 71^b 21, 76^a 10; differs with different matter 43^a 12; the actual identical with the potential 45^b 21; coni. complete reality (ἐντελέχεια) 47^a 30, 50^a 23;)(knowledge 48^b 15;)(motion 48^b 28; coni. action 50^a 23; God's actuality pleasure 72^b 16; actual, syn. individual 14^a 21.

Addible numbers M. 6–8.

Affection, modification (πάθος), its meanings Δ. 21;)(substance 983^b 10, 985^b 11, 38^b 28, 71^a 1; coni. states 986^a 17, 20^a 19; coni. accidents, movements 989^b 3, 71^a 1;)(substratum 49^a 29; essential, proper affections 4^b 6, 58^a 37, ^{b} 22, 78^a 16; change in respect of 69^b 12.

Alcmaeon 986^a 26.

All (πάντα), coni. total 24^a 8.

Alteration 989^a 27, 42^a 36, 69^b 12, 88^a 32.

Analogy 43^a 5, 48^a 37, ^{b} 7, 89^b 3, 93^b 19; the same by 16^b 32, 18^a 13, 70^a 32, ^{b} 17, 71^a 4, 26, 93^b 18.

Anaxagoras 984^a 11–16, ^{b} 18, 985^a 18–21, 988^a 17, 28, 989^a 30–^{b} 21, 991^a 16, 9^a 27, 12^a 26, 63^b 26–30, 69^b 20, 31, 72^a 5, 75^b 8, 79^b 20, 91^b 11; quoted 7^b 25, 9^b 25, 56^b 28.

Anaximander 69^b 22; referred to 52^b 10, 53^b 16.

Anaximenes 984^a 5; referred to 988^a 30, 996^a 9, 53^b 16.

Antisthenes 24^b 32; his school 43^b 24.

Appearance (φαίνεσθαι, φαντασία) Γ. 5, 6, 980^b 26, 70^a 10. Cf. *Image*.

Archytas 43^a 22.

Aristippus 996^a 32; referred to 78^a 33.

Aristotle, references to *An. Post.* 25^a 34 (?), 37^b 8; *Phys.* 983^a 33, 985^a 12, 986^b 30, 988^a 22, 993^a 11, 42^b 9 (?), 49^b 36, 59^a 34, 62^b 31 (?), 73^a 5 (?), 32 (?), 76^a 9, 86^a 23; *De Coelo* 986^a 12 (?), 989^a 24 (?), 73^a 5 (?), 32 (?), 86^a 23 (?), 88^b 24; *De Gen. et Corr.* 989^a 24 (?), 42^b 9 (?), 62^b 31 (?), 86^a 23 (?); *Met.* A. 995^b 5, 996^b 8, 14, 997^b 4, 59^a 19; B. 993^a 26, 4^a 32, 53^b 10, 76^b 1, 77^a 1, 86^a 34 (?), ^{b} 15; Γ. 45^b 32 (?); Δ. 26^a 34, 28^a 4, 11, 46^a 5, 49^b 4, 52^a 15, 55^a 2, ^{b} 7, 56^b 35; E. 25^a 34 (?); Z. 42^a 4, 18, 20, 43^b 16, 45^a 7 (?), ^{b} 32 (?), 49^b 27, 53^b 17; H. 37^a 20 (?), 39^a 22 (?); Θ. 17^b 9, 21^a 20, 27^b 29, 88^b 24 (?); K. 25^a 34 (?); Λ. 27^a 19, 37^a 13 (?), 64^a 36, 78^b 5 (?); M. 37^a 13 (?), 42^a 22 (?), 90^a 15, 28; N. 37^a 13 (?), 42^a 22 (?), 78^b 5 (?), 86^a 30; *Eth. Nic.* 981^b 25; lost works 986^a 12 (?), 4^a 2, ^{b} 34, 54^a 30.

Arithmetic 982^a 28, 5^a 31, 90^a 14; arithmetical number 83^b 16.

Art 980^b 28; comes by experience 981^a 3;)(science 981^b 26;)(experience 981^a 25, ^{b} 8, 31; generation by art, reason, potency, spontaneity Z. 7, 8, 25^b 22, 34^a 9; = form 34^a 24, 70^a 15; comes by learning 46^b 37, 47^b 33;)(nature

32^a 12, 70^a 6, 17; architectonic arts 13^a 14.
Assertion, syn. affirmation 8^a 4–^{b} 1, 62^a 24;)(affirmation, syn. contact 51^b 24.
Astronomy 989^b 33, 997^b 16, 35, 998^a 6, 53^a 10, 73^b 5, 77^a 2.
Attribute)(substance 995^b 20, 3^a 25.
Axioms 996^b 26, 5^a 20, ^{b} 34, 90^a 36.

Beautiful, syn. good 13^a 22, 91^a 31;)(good 78^a 31; an original principle 72^b 32.
Becoming, v. *Generation*.
Being (ὄν) Δ. 7, 19^a 5, 28^a 10, 30^a 21, 42^b 26, 45^b 32, 61^a 8, 78^a 30, 89^a 6; not a genus 998^b 22, 45^b 6; and unity I. 2, 986^b 15, 998^b 22, 33, 1^a 5, 3^b 22, 40^b 16, 45^b 6, 53^b 25; being *qua* being, in general, without qualification)(particular being Γ. 1–2, E. 1, 60^b 31; accidental being E. 2, 3, 17^a 7; being as truth E. 4, Θ. 10, 65^a 21; in full sense 27^b 31, 51^b 1; primary being, substance 28^a 14, 30; being of a thing 29^a 22, 52^b 11, 75^b 5; being not the substance of things 1^a 5, 40^b 18; completely real)(material 78^a 30; non-being *is* non-being 3^b 10; subject of sophistic 26^b 14; as falsity E. 4, Θ. 10; source of becoming 62^b 26, 69^b 18; three kinds 69^b 27; ambiguous 89^a 16; proof of its reality (Platonic) 89^a 1.
Between, v. *Intermediate*.
Broad and narrow (Platonic) 992^a 12, 88^b 8.

Callippus 73^b 32.
Categories 4^a 29, 17^a 23, 24^b 13, 26^a 36, 27^b 31, 28^a 13, 33, 29^b 23, 34^b 10, 51^a 35, 55^a 1, 58^a 14, 70^b 1, 88^a 30, 89^a 27, ^{b} 24.
Cause Δ. 2, 13^a 16, ^{b} 9, 26^a 16; philosophy a study of first causes 981^b 28; of *all* causes? 995^b 6, 996^a 18; primary 983^a 25, 3^a 31; proximate 44^b 1; four causes 983^a 26, 70^b 26; formal = final 44^b 1; = efficient 70^b 26; causes not infinite in number *a*. 2, 74^a 29; cause of accident accidental 27^a 8, 65^a 6; generable without being generated E. 3. v. *End*, *Essence*, *Final*, *Form*, *Formula*, *Matter*, *Motive*, *Principle*.
Change, by something to something 984^a 22, 69^b 36; from opposite to opposite or intermediate 11^b 34, 57^a 21, 31, 69^b 3; contraries do not change 69^b 7; coni. non-being, substratum, matter, potency 10^a 15, 42^a 33, 69^b 14, 24; four kinds 42^a 32, 69^b 9, 72^b 8; changeable substance 69^b 3.
Complete Δ. 16, 23^a 35; def. 55^a 11; said to proceed from incomplete 72^b 34, 92^a 13.
Compound (σύνθετον) 23^a 31, ^{b} 1, 29^b 23, 43^a 30, 75^a 8, 88^b 16.
Concrete (σύνολον) 995^b 34, 999^a 33, 29^a 5, 35^b 20, 37^a 26, 30, 77^b 9.
Contact 2^a 34, 14^b 22, 68^b 27, 70^a 10, 82^a 20, 85^a 3; syn. intuitive thought 51^b 24, 72^b 21.
Contiguous 69^a 1.
Continuous, def. 69^a 5; by nature, art, force 16^a 4, 23^b 34, 40^b 15; in one, two, three dimensions 61^a 33; continuity)(form 16^b 9.
Contradiction, law of Γ. 3–6, K. 5, 6; no intermediate Γ. 7, 55^b 1, 69^a 3;)(privation, contrariety 55^b 1.
Contrary I. 4, 5, 7, 13^b 12, 18^a 25, 54^a 25, ^{b} 31, 58^b 26, 92^a 2; contraries said to be principles of being 986^a 22, ^{b} 1, 4^b 30, 75^a 28, 87^a 30; knowledge of them one 996^a 20, 61^a 19, 78^b 26; reducible to one principle 4^a 1, ^{b} 27; contrariety)(difference, otherness, contradiction, privation 4^a 20, 54^b 32, 55^b 1; one of two contraries always privative 4^b 27, 11^b 18, 55^b 14, 27, 61^a 20, 63^b 17; contraries incompatible 11^b 17, 63^b 26; coni. negation 12^a 9; contrariety in substance 18^b 3; contraries have same form 32^b 2; not produced from, compounded of, affected by one another 44^b 25, 57^b 22, 69^b 7, 75^a 30; contrariety = greatest, complete difference 55^a 4, 16, 58^a 11; one term one contrary 55^a 19; contraries relative 56^b 36; intermediate composed of contraries I. 7; which contrarieties make difference of species I. 9; prime contrarieties in being 61^a 12, ^{b} 5, 13; sensible contrarieties 61^a 32; in place 68^b 29;)(opposite 69^b 4; contraries involve matter 75^b 22, 87^b 1.

Counter-earth 986^a 12.
Coupled term (συνδεδυασμένον) 30^b 16, 31^a 6, 43^a 4.
Cratylus 987^a 32, 10^a 12.

Definition Z. 10, 11, H. 6, 31^a 2, 43^a 21; starting-point of discussion 12^a 22, ^{b} 7; coni. essence 30^a 7, 31^a 11, 44^a 2; not of the concrete and sensible 36^a 2, 39^b 28; of the universal 36^a 28; why one Z. 12, H. 6; definition by division 37^b 28; scientific 39^b 32; no Idea definable 40^a 8; coni. number 43^b 34, 45^a 7. v. *Formula*.
Democritus 985^b 5–20, 9^a 27, ^{b} 11, 15, 39^a 9, 42^b 12, 69^b 22, 78^b 20; referred to 84^b 27.
Demonstration 992^b 31; principles of 993^b 28, 996^b 26, 5^b 9, 11, 13, 18, 22, 62^a 3; not everything demonstrable 997^a 7, 6^a 8, 11^a 13; essence not demonstrable 25^b 14, 64^a 9; sensible things not demonstrable 39^b 28; demonstration of necessary truths 39^b 31; absolute and *ad hominem* 62^a 2; demonstrative science 997^a 5–30.
Destructible, destruction 994^b 6, 0^a 5, 22, 27, ^{b} 25, 27^b 29, 42^a 30, 43^b 15, 44^b 36, 59^a 1, 67^b 24, 69^a 31, ^{b} 11, 70^a 15.
Dialectic 987^b 33, 995^b 23, 4^b 17, 78^b 25.
Differentia, difference 985^b 13, 998^b 23, 4^a 13, 20^a 33, 35, ^{b} 2, 15, 42^b 16; its meanings 18^a 12;)(otherness, contrariety 4^a 20, 54^b 23, 55^a 4, 16, 58^a 11; opposite, prior, contrary differentiae 16^a 25, 57^b 6, 11; generic, specific 18^a 26, 54^b 28, 58^a 7; definition by 42^b 32, 43^a 19; what makes it I. 9; matter does not make it 58^b 6; first differences 61^b 14; of numbers, units M. 6–8; three differences (Democritus) 985^b 13, 42^b 12.
Diogenes 984^a 5.
Disposition Δ. 19.
Divine, the 26^a 20, 64^a 37; not jealous 982^b 32; encloses the universe 74^b 3; visible divine bodies 26^a 18; the divinest knowledge 983^a 5.
Division, mathematical 994^b 24, 2^a 19, ^{b} 3, 10, 48^b 16, 60^b 14, 19; logical 37^b 28.
Dyad (two), indefinite 987^b 26, 33, 988^a 13, 81^a 14, 22, ^{b} 21, 32, 82^a 13, ^{b} 30, 83^b 36, 85^b 7, 87^b 7, 88^b 28, 89^a 35, 91^a 5; ideal 36^b 14, 81^a 23, ^{b} 27, 82^b 9, 12, 20, 22; the first number 999^a 8, 85^b 10, 88^b 9.

Egypt 981^b 23.
Eleatics referred to 986^b 10, 1^a 75^b 15.
Element Δ. 3, M. 10, 989^a 4, 992^b 19, 1^a 18, 59^b 23, 88^b 4; whether only potential 2^b 33; coni. principle, cause 41^b 31, 70^b 25, 87^a 2, 91^a 31; four elements (Empedocles) 984^a 8, 985^a 32, 998^a 30; of Ideas 987^b 19.
Empedocles 984^a 8, 985^a 2–10, 21–^{b} 4, 988^a 16, 27, 989^a 20–30, 993^a 17, 996^a 8, 998^a 30, 0^a 24–^{b} 20, 1^a 12, 69^b 21, 72^a 6, 75^b 2, 91^b 11; quoted 0^a 29, ^{b} 2, 6, 14, 9^b 17, 14^b 37; referred to 4^b 33, 50^b 24 (?), 53^b 15, 92^b 7.
End, syn. final cause 994^b 9, 16, 13^a 33, 59^a 37, 74^a 30; coni. shape 23^a 34; coni. actuality 51^a 15.
Epicharmus 10^a 6, 86^a 16.
Equal, def. 21^a 12, 56^a 22, 82^b 7; how opposed to great and small I. 5; syn. one (Plato) 87^b 5.
Equivocal, equivocation 3^a 34, 30^a 32, 35^b 25, 46^a 6, 60^b 33, 86^b 26.
Eristic 12^a 19.
Error)(ignorance 52^a 2.
Essence (τί ἦν εἶναι) Z. 4–6, 8, 993^a 18, 994^b 17, 25^b 29, 38^b 14, 45^b 3; coni. definition 30^a 7; coni. form 33^b 5.
Eternal 987^b 16, 15^b 14, 50^b 7, 51^a 20; eternal sensible substance 69^a 31, ^{b} 25; necessity of an eternal substance Λ. 6; time eternal 71^b 7; eternal things, whether composite 88^b 14; ungenerated 91^a 12.
Eudoxus 991^a 17, 73^b 17, 79^b 21.
Eurytus 92^b 10.
Even (Pythagorean) 986^a 18, 990^a 9, 91^a 24.
Evenus 15^a 29.
Evil, none apart from particular bad things 51^a 17; none among eternal things 51^a 20; said to be a first principle 75^a 35, 91^b 34; caused by strife (Empedocles) 984^b 32.

INDEX

Excess and defect 992b 6, 4b 12, 42b 25, 35, 52b 30, 57a 13, 87b 18.

Experience 980b 29; coni. science, art 981a 1, b 31; = knowledge of individual facts 981a 15.

Falsity, def. 11b 25; its meanings, Δ. 29; non-being in sense of falsity E. 4, Θ. 10;)(impossibility 47b 14; a first principle (Plato) 89a 20.

Female sex, coni. matter 24a 35; not a species I. 9.

Final cause (οὗ ἕνεκα) 983a 31, 994b 9, 13a 21, 33, b 26, 44b 1, 50a 7, 59a 36, 72b 2. v. *End.*

First, its meanings 28a 31. v. *Primary.*

Form, things referred to by naming their form 35a 8; more real than, cause of, matter 29a 5, 41b 7; coni. essence 32b 1, 33b 5, 35b 32; syn. shape 999b 17, 15a 6, 17b 25, 33b 5, 44b 22, 52a 23, 60a 22, b 26; = art 34a 24, 70a 15; not generated 34b 7, 42a 30, 43b 17, 44b 21, 69b 35, 70a 15; coni. definition, formula 16b 9, 35a 21, 36a 28, b 5, 42a 28, 43a 19, 44b 12, 69b 33, 84b 10; syn. substance 32b 1, 41b 8, 50b 2, 84b 10; syn. positive state 44b 33;)(becoming 50a 4;)(matter 50a 15, 70a 1, 84b 10;)(privation 44b 33, 70b 12; its parts Z. 10, 11. v. *Shape, Species.*

Forms (Platonic), v. *Ideas.*

Formula (λόγος) 987b 31, 16a 33, b 9, 28a 34, 42a 28, 43a 19, b 26, 47b 34, 50b 33; principles in the 996a 1; formula of the essence is one 998b 12;)(word, coni. definition 6b 1, 30a 7; parts of Z. 10, 11, 16a 35, 23b 23, 33a 2; prior in 18b 31, 28a 32, 38b 27, 49b 11, 54a 28, 77b 1, 78a 10;)(concrete individual, matter 39b 20, 58b 10, 17, 64a 23, 74a 34; separable in 42a 29; = final cause 44b 1; = efficient 70b 30; coni. science 46b 7, 59b 26; analysis of 63b 18; cause as formula 70a 22; indivisible in formula, in time, 84b 15; one in formula, in number 87b 12.

Friendship (Empedocles) 985a 3, 24, 988a 33, 0b 11.

'From', its meanings Δ. 24, 991a 19, 994a 22, 44a 23, 92a 32.

Full (Democritus) 985b 5, 9a 28.

Generation, is of the concrete thing Z. 8, 981a 17, 34b 7, 42a 30, 43b 17, 44b 21, 69b 35, 70a 15; posterior in generation, prior in nature, form, substance 989a 15, 50a 4, 77a 27; two types 994a 22; from non-being, matter, privation, contraries, the potential 994a 27, 32a 20, 33a 9, 55b 11, 62b 26, 69b 18, 88b 17, 91b 34; of something from something by something 999b 6, 10a 21, 32a 13, b 31, 33a 24, 44b 24, 49b 28; by nature, art, spontaneity Z. 7, 9;)(making 32a 26; the generated must be divisible 33b 12, 49b 35; from a member of the same species 34a 21, 49b 29, 70a 5; absolute and partial 42b 7, 67b 22, 69b 10, 88a 33.

Genus Δ. 28, 54b 30, 57a 26, b 38, 59b 27; proximate, ultimate 995b 29, 998b 16, 999a 31, 23a 27, 34a 1, 37b 30, 59b 27; whether genera are first principles 998a 21, 14b 11, 42a 14, 69a 28; part of species 23b 24; coni. definition, differentia, species Z. 12, 998b 5, 13–999a 23, 14b 10, 16a 24, b 32, 22a 27, 23b 18, 37b 19, 39a 26, 54b 27, 57b 7, 59b 36; being and unity not genera 998b 22, 45b 6; is matter of species 24b 8, 38a 6; other in genus 24b 9;)(universal 28b 34; not substantial Z. 13, 42a 21, 53b 21; otherness of the genus 58a 7.

Geometry 983a 20, 992a 21, 997b 27, 998a 2, 5a 11, 31, 51a 21, 61b 3, 78a 25, 89a 21.

God, a first principle 983a 8; His life 72b 14; identified with the One by Xenophanes 986b 24; gods in human form 997b 10, 74b 5; the stars held to be gods 74b 2.

Good, syn. final cause 983a 31, 59a 36; syn. beautiful 13a 22, 91a 31;)(apparent good 13b 27; how a first principle 75a 12, 38;)(beautiful 78a 31; whether discussed by mathematics 78a 31; how related to first principles 91a 30, 92a 9; Idea of 996a 28.

Great and small, how opposed to

INDEX

equal I. 5; (Plato) 987^b 20, 26, 988^a 26, 992^a 12, 998^b 10, 83^b 23, 32; kinds of 992^a 11, 85^a 9.

Habit, having, state (ἕξις) Δ. 20, 986^a 17, 15^b 34, 44^b 33, 46^a 13, 70^a 12;)(privation 55^b 13.
Harmonics 997^b 21, 77^a 5, 78^a 14, 93^b 22.
Have, hold, its meanings Δ. 23.
Hearing 980^b 23.
Heaven, only one 74^a 31.
Heraclitus 984^a 7, 987^a 33, 5^b 25, 10^a 13, 12^a 24, 34, 62^a 32, 63^b 25, 78^b 13; referred to 989^a 2, 996^a 9, 1^a 15.
Hermotimus 984^b 19.
Hesiod 989^a 10, 0^a 9; referred to 983^b 28; quoted 984^b 23.
Hippasus 984^a 7.
Hippo 984^a 3.
Homer 9^b 28; quoted 76^a 4.
Homoeomerous 984^a 14.
Hot, the (Parmenides) 987^a 1.
Hypothesis)(necessary principle 5^b 15.

Ideas (Platonic) A. 6, 9, B. 6, Z. 6, 14, M. 4, 5, 988^b 1, 997^b 2, 999^a 6, 30, 1^a 4, 28^b 20, 33^b 27, 36^b 13, 42^a 11, 59^a 10, 70^a 27, 73^a 18, 75^b 18, 76^a 31, 83^b 34, 86^a 31, ^{b} 14, 90^a 16, ^{b} 20, 91^b 28; elements of 987^b 19; of negations 990^b 13, 79^a 9; of relations 990^b 16, 79^a 12; of manufactured objects 991^b 6, 60^b 28, 70^a 14; coni. numbers 991^b 9, 76^a 20, 80^b 12, 22, 81^a 21, 83^b 3, 86^a 4, 88^b 34, 90^b 33, 35, 91^a 26; participable 990^b 28, 40^a 27; eternal sensibles 997^b 12; as causes 33^b 26; how related 39^b 4; indefinable 40^a 8; transcendent 40^a 9, 86^a 33; universal 42^a 15, 86^a 33.
Ignorance)(falsity, error 52^a 2.
Iliad, an artificial unity 45^a 13.
Image (φάντασμα) 990^b 14, 79^a 11. v. *Appearance*.
Imitation (Pythagorean) 987^b 11.
Imperishable I. 10, 40^b 31.
Impossible 19^b 22;)(false 47^b 14.
'In,' its meanings 23^a 24.
Inaddible numbers M. 6-8.
Incapacity, its meanings 19^b 15, 46^a 29.
Incomposite entities 51^b 17, 27.
Increase 42^a 35;)(diminution 69^b 11, 88^a 32.
Individual (ἄτομον) 995^b 29, 999^a 12; (καθ' ἕκαστον) action concerned with individuals 981^a 17; is there anything apart from individuals? 999^a 26, 60^a 3; syn. numerically one 999^b 33; are the first principles individual? M. 10, 3^a 7, 71^a 20; syn. actual 14^a 21; prior in order of perception 18^b 33; (τόδε τι) 30^a 5, 70^a 10. v. '*This*'.
Indivisible (ἀδιαίρετον) I. 1; in quantity, in kind 999^a 3, 14^a 27, 16^a 19, 21; in formula, in time 84^b 15; (ἄτομον) lines, magnitudes 992^a 22, 83^b 13, 84^b 1; species, form 998^b 29, 34^a 8, 58^a 18; indivisible in genus 18^b 6.
Induction)(demonstration, definition 992^b 33, 48^a 36; used 25^b 15, 54^b 33, 55^a 6, ^{b} 17, 58^a 9, 64^a 9; Socratic 78^b 28.
Infinite, the α. 2, K. 10; as substance and principle 987^a 16, 990^a 9, 4^b 33; composed of great and small 987^b 26; causes not infinite in number α. 2, 74^a 29; not thinkable 994^b 22, 30, 999^a 27; by addition 994^b 30; how potential 48^b 9; has no separate existence 48^b 15; infinite regress 994^a 3, 8, 20, ^{b} 4, 0^b 28, 6^a 9, 10^a 22, 12^a 12, ^{b} 22, 22^b 9, 30^b 35, 32^a 3, 33^b 4, 41^b 22, 60^a 36, 70^a 2, 74^a 29; no infinite magnitude 73^a 10; whether number is infinite 83^b 36; principles infinite in number (Anaxagoras) 984^a 13.
Intelligible)(sensible 990^a 31, 999^b 2, 36^a 3, 10, 45^a 34.
Intermediate, def. 57^a 21, 68^b 27; no intermediate between contradictories 11^b 23, 12^a 1, 55^b 1, 69^a 3; composed of contraries I. 7; Platonic 987^b 16.
Intuition (νόησις), coni. sensation, definition 36^a 6. v. *Thinking*.
Italian school 987^a 10–31, 988^a 26.
'Itself,' used to signify Ideas 40^b 34.

Knowledge, desired by all 980^a 21; springs from sensation 980^a 28;)(art 981^b 26; theoretical, productive, practical 982^a 1, ^{b} 9, 993^b

20, 25^b 21, 46^b 2; pure, applied, superior, ancillary 982^a 15, 30, ^{b} 4, 27, 996^b 10; its highest object 982^b 1, 996^b 13; the divinest knowledge 983^a 5; is of causes 983^a 25, 993^b 23, 994^b 29, 25^a 6; not of the sensible or accidental Z. 15, 987^a 34, 26^b 3, 27^a 20, 64^b 30, 65^a 5, 77^b 35; knowledge of contraries one 996^a 20, 61^a 19, 78^b 26; is of species, form 998^b 7, 31^b 6, 35^a 8;)(sensation 999^b 3; of universals, individuals 994^b 21, 3^a 14, 59^b 26, 60^b 20, 86^b 6, 87^a 15; one science to one genus 3^b 10, 55^a 31;)(opinion 8^b 28, 30, 39^b 33; prior in 18^b 30, 28^a 32, 38^b 27 (?); ratiocinative 25^b 6; not of matter 36^a 8; coni. formula 28^a 32, 46^b 7, 59^b 26;)(actuality 48^b 15; how a measure of objects 57^a 9; its two meanings 87^a 15.

Leucippus 985^b 4, 71^b 32, 72^a 7; referred to 84^b 27.
Like, def. 18^a 15, 21^a 11, 54^b 3; said to be known by like 0^b 5.
Limit, its meanings Δ. 17; of bodies 2^b 10, 60^b 16; (Pythagorean) 987^a 15, 990^a 8, 4^b 33.
Line 2^a 5, 16^b 26, 36^b 12, 43^a 33; perceptible lines 998^a 1; not composed of points 1^b 18; indivisible line 992^a 22, 84^b 1.
Logic (ἀναλυτικά) 5^b 4.
Love (Parmenides) 984^b 24, 988^a 34.
Luck (τύχη) 981^a 5, 984^b 14, 32^a 29, 65^a 30; generation by nature, art, spontaneity, luck Z. 7, 49^a 3, 70^a 6.
Lycophron 45^b 10.

Magi 91^b 10.
Making)(generation 32^a 26;)(thinking 32^b 15.
Male and female I. 9.
Many)(one I. 3, 6, 87^b 28;)(much 56^b 15; matter of the one 75^a 33; and few (Platonic) 87^b 16.
Mathematics 981^b 24, 985^b 24, 992^a 32, 996^a 29, 4^a 9, 26^a 7, 9, 12, 19, 61^a 28, ^{b} 32, 64^a 32, 77^b 18, 78^a 33; mathematical objects)(perceptible 989^b 32, 990^a 15, 36^a 4;)(Ideas B. 6, 28^b 20, 76^a 20, 83^a 23, 90^b 27; many of one species 2^b 14; whether substances M. 1–3, 42^a 11, 69^a 35; not separable 59^b 13; mathematical matter 992^b 2, 59^b 16; language 995^a 6, 80^b 26; parts of mathematics 4^a 7; mathematical sciences)(productive 64^a 1; mathematical number M. 6, 76^a 20, 86^a 5.
Matter H. 3, 4, 983^b 7–984^a 18, 998^b 23, 15^a 8, 17^a 3, 42^a 25, 58^b 6, 14; def. 29^a 20; syn. substratum 983^a 29, 985^b 10, 988^a 12, 992^b 1, 22^a 18, 24^b 8, 42^a 26, 32, ^{b} 9, 61^b 22, 70^a 11; a principle 983^b 7, 986^a 17, 46^a 23;)(formula, form, complete reality, actuality 986^b 20, 29^a 5, 35^a 8, 38^b 6, 41^b 7, 43^a 6, 45^a 35, 50^a 15, 70^a 1, 71^b 21, 74^a 34, 76^a 9, 78^a 30, 84^b 9; coni. female sex 24^a 35; genus matter of species 24^b 8, 38^a 6; coni. motion 26^a 3; cause of accident 27^a 13; whether substance Z. 3, 42^a 27, 49^a 36, 77^a 36; necessary, to explain generation and change 32^a 17, 42^a 32, 44^b 27, 69^b 3; parts of matter)(of definition Z. 10, 11; unknowable in itself 36^a 8; sensible)(intelligible 36^a 9, ^{b} 36, 45^a 34; indefinite 37^a 27, 49^b 1; coni. potency 39^b 29, 42^a 27, ^{b} 10, 49^a 23, 50^a 15, 60^a 21, 69^b 14, 70^b 12, 71^a 10, 88^b 1, 92^a 3; not perishable 42^a 30; matter for locomotion, generation, &c. 42^a 34, ^{b} 6, 69^b 26; actuality varies with it 43^a 12; proximate matter 44^a 18;)(substratum 44^b 9; proximate matter = shape 45^b 18; of mathematical objects 992^b 2, 59^b 16; different things have different matter 69^b 25; individual in appearance 70^a 10; involved in contraries 75^b 22, 87^b 1.
Measure, def. of unity 52^b 18, 87^b 33; accurate, homogeneous with thing measured, indivisible 52^b 36, 53^a 25, 88^a 2; how knowledge is a measure 57^a 9; man the measure of all things 53^a 36, 62^b 14, 19, 63^a 4.
Megaric school 46^b 29.
Melissus 986^b 19.
Memory 980^a 29.
Middle, excluded Γ. 7.
Mind (νοῦς) Λ. 7, 9, 70^a 26; in nature 984^b 15; human 993^b 11, 75^a 7;)(art, potency 25^b 32;

acts by contact 72^b 21; divinest of things 74^b 16; (Anaxagoras) 984^b 16, 989^b 15, 17, 69^b 31; (Parmenides) 9^b 23.
Mixture 989^b 2, 42^b 29, 82^a 21, 92^a 24.
Monists 986^b 21.
Motion (κίνησις), coni. sensation, matter 989^b 32, 26^a 3, 36^b 29;)(rest 4^b 29, 10^a 36, 12^b 23, 25^b 21, 49^b 8; coni. activity, action 20^b 20, 22^a 7, ^{b} 5, 23^a 18; coni. nature 25^b 20;)(action 48^b 18;)(actuality 48^b 28; eternal 49^b 35, 71^b 7, 33; simple, continuous, unresting, uniform motion 53^a 9, 71^b 10, 72^a 21, 78^a 13.
Motion, spatial (φορά) 69^b 12, 26, 72^b 5; the first kind of change 72^b 8, 73^a 12; simple 73^a 29; of the planets Λ. 8.
Motive cause Λ. 3, 4, 983^a 30, 984^a 27, 988^b 27, 996^b 7, 13^b 9, 24, 70^a 21; necessity of 991^b 5, 80^a 4; prior to the moved 10^b 37, 70^a 21; unmoved prime mover Λ. 7, 12^b 31; fire a motive cause 984^b 6; the self-mover (Platonic) 72^a 1.
Mutilated Δ. 27.
Myth 982^b 18, 983^b 29, 995^a 4, 0^a 9, 18, 71^b 27, 74^b 1, 4, 75^b 26, 91^a 34.

Nature, its meanings Δ. 4;)(habit, spontaneity, luck, thought 981^b 4, 32^a 12, 65^a 27, 70^b 30, 71^b 35;)(generation 989^a 15; not the whole of reality 5^a 34; syn. matter 14^b 33, 24^a 4;)(force 15^b 15, 52^a 23, 71^b 35; = that which contains its principle of motion in itself 14^b 18, 25^b 20, 49^b 8, 70^b 8; by nature)(to us 29^b 7;)(art 32^a 12, 70^a 7, 17; syn. form, complete reality, positive state 32^a 24, 44^a 9, 70^a 11; the only substance in destructible things 43^b 23;)(potency 49^b 8; natural objects, bodies, substances 14^b 19, 32, 28^b 10, 42^a 7, 70^a 5, 90^a 32;)(unnatural 33^b 33.
Necessity, def. 6^b 31; its meanings 26^b 28, 64^b 33; necessary, its meanings Δ. 5, 72^b 11;)(usual, accidental 25^a 15, 18, 20, 26^b 28, 64^b 33; objects of demonstration necessary truths 39^b 31.
Negation)(privation 4^a 12; coni. contrariety 12^a 9; privative negation 56^a 17, 29; Ideas of negations 990^b 13, 79^a 9.
Non-rational potencies 46^b 2, 48^a 4, 50^b 33.
Number M. 6–9, N. 1–3, 5, 6, 20^a 13, 57^a 3; numerical ratio 985^b 32, 991^b 13, 17, 19, 993^a 17, 1^b 30, 53^a 16, 61^b 1, 92^b 14, 31; said to be limited by ten 986^a 8, 73^a 20, 84^a 12; elements, attributes, generation of number 986^a 17, 4^b 10, 84^b 28, 87^b 14, 89^b 12, 90^a 21, 91^a 23, 28; numbers as principles, substances 985^b 26, 986^a 17, 987^a 19, ^{b} 24, 1^a 25, ^{b} 26, 36^b 12, 76^a 31, 80^a 13, 83^a 23, 90^a 3, 21, 92^b 16, 26; prime numbers 987^b 34; sensible)(intelligible, ideal 990^a 32, 90^b 35; coni. Ideas 991^b 9, 76^a 20, 80^b 12, 81^a 7, 21, 83^b 3, 86^a 4, 88^b 34, 90^a 16, ^{b} 33, 91^a 26; wherein does its unity consist? 992^a 1, 44^a 2, 45^a 7; numerical unity 999^b 25, 32, 16^b 31, 18^a 13, 33^b 31, 39^a 28, 54^a 34, 60^b 29, 87^b 12; unity the origin and measure of number 16^b 18, 52^b 24; quality, differentia of number M. 6–8, 20^b 3; coni. definition 43^b 34, 45^a 7; addible)(inaddible M. 6–8; mathematical, arithmetical number 76^a 20, 80^a 21, 31, ^{b} 13, 83^b 3, 16, 86^a 5, 90^b 34, 91^b 24; related as prior and posterior 80^b 12; number composed of abstract units 39^a 13, 80^b 19, 30, 82^b 6, 83^b 16; infinite or finite? 83^b 36; powers of two 84^a 6;)(formula 87^b 12; one not a number 88^a 6; numerical succession 85^a 4; square, cube 93^a 7.

Odd (Pythagorean) 986^a 18, 990^a 9, 91^a 22.
One I. 1–3; its meanings Δ. 6, 52^a 17; one in many 990^b 7, 13, 991^a 2, 40^b 29; unity and being I. 2, 998^b 22, 1^a 5, 3^b 22, 40^b 16, 45^b 6; not a genus 998^b 22, 45^b 6; = indivisible 999^a 2, 41^a 19; in quantity, species, number, genus, by analogy 999^a 2, ^{b} 25, 32, 16^b 31, 18^a 13, 33^b 31, 39^a 28, 54^a 34, 60^b 29, 87^b 12; unity of common reference, of succession, of common predicability, of meaning, 3^a 33, 5^a 11, 6^b 15; one in continuity,

form, formula 16^b 9; origin and measure of number 16^b 18, 52^b 24; the one not substance I. 2, 40^b 18; unity of number and of definition Z. 12, H. 6, 992^a 1, 44^a 3; the one a measure 52^b 18, 87^b 33; one and many I. 3, 6, 87^b 28;)(simple 72^a 32; the many, matter of the one 75^a 33; one by contact, mixture, &c. 82^a 20; primary one 83^a 25; in what sense a principle 84^b 18; one in formula, in number 87^b 12; not a number 88^a 6; (Pythagoreans) 986^a 20, 987^a 18, 27, 1^a 10; (Eleatics) 986^b 15, 1^a 33, 89^a 2; (Plato) M. and N. *passim*, 987^b 21, 992^a 8, 1^a 5; (Anaxagoras) 989^b 17.

Opinion)(knowledge 8^b 28, 30, 39^b 33.

Opposition, its kinds Δ. 10, 54^a 24, 55^a 38, 57^a 33; change to opposites 11^b 34, 57^a 31, 69^b 4; opposite differentiae 16^a 25; potency of opposites 50^b 8, 30; opposite)(contrary 69^b 4.

Order 984^b 15, 985^b 14; not in substance 38^a 33.

Other, def. 18^a 9; its meanings 54^b 14; in species I. 8, 9, 18^b 1; in genus 24^b 9; otherness of the genus 58^a 7; otherness)(difference 54^b 23.

Parmenides 984^b 3, 986^b 18–987^a 2, 1^a 32; quoted 984^b 25, 9^b 21, 89^a 3; referred to 4^b 32.

Part, its meanings Δ. 25, 34^b 32; parts of definition, of matter Z. 10, 11.

Participation 987^b 13, 991^a 14, ^{b} 5, 30^a 13, 31^b 18, 37^b 18, 45^a 18, ^{b} 8, 79^b 18; Ideas participable 990^b 28, 40^a 27, 79^a 25.

Pauson 50^a 20.

Perishable. v. *Destructible.*

Petitio principii 6^a 17, 20.

Pherecydes 91^b 9.

Philosophy is knowledge desirable for its own sake, most accurate, communicable, most divine and honourable A. 2; starts from wonder 982^b 11; turned into mathematics 992^a 32; is knowledge of the truth 993^b 20; treats of the axioms Γ. 3, K. 4, 995^b 8; treats of being as being Γ. 1, 2, K. 3; has distinct parts 4^a 2, 26^a 18;)(dialectic, sophistic 4^b 17; theoretical, practical, &c. E. 1; first philosophy 26^a 24; the philosopher fond of myth 982^b 18; can speculate about anything 4^a 34.

Phrynis 993^b 16.

Physics 986^b 14, 989^b 30, 990^a 3, 7, 992^b 4, 995^a 18, 1^a 12, 5^a 31, 34, ^{b} 1, 6^a 2, 25^b 19, 26, 26^a 5, 12, 37^a 14, 16, 59^b 16, 61^b 6, 28, 62^b 22, 26, 69^a 36, 71^b 27, 75^b 27, 78^b 19.

Place 92^a 17; change of 42^a 34, 69^b 13.

Planets Λ. 8.

Plato A. 6, 9, 988^a 26, 990^a 6, 30, 996^a 6, 1^a 9, 19^a 4, 28^b 19, 53^b 13, 83^a 32; referred to Z. 14, M. and N. *passim*, 995^b 16, 997^b 1, 998^b 9, 1^b 19, 2^a 11, ^{b} 12, 31^a 30, 33^b 27, 34^a 2, 44^a 8, 50^b 35, 51^a 19, 59^a 10, ^{b} 3, 60^b 6, 69^a 26, 70^a 27, 71^b 15, 73^a 17, 75^b 19, 27; his works quoted, *Hippias Minor* 25^a 6, *Laws* 72^a 1 (?), *Phaedo* 991^b 3, 80^a 2, *Phaedrus* 72^a 1 (?), *Sophistes* 26^b 14, 30^a 25, 64^b 29, 89^a 20, *Theaetetus* 10^b 12, *Timaeus* 19^a 4 (?), 71^b 32, 72^a 2.

Platonists referred to M. and N. *passim*, 998^a 7, 17, 28^b 15 (?), 24, 31^a 31, 36^b 13, 40^b 2, 45^a 16, 56^a 10, 69^a 35, 75^a 32, ^{b} 37.

Plurality 57^a 3, 87^b 5, 91^b 34; def. 20^a 8, 54^a 22;)(unity 4^a 10, 16; first plurality 85^b 9.

Point 992^a 19, 16^b 26, 60^b 18, 85^b 28.

Polus 981^a 4.

Position 985^b 15, 16^b 26, 22^b 2, 42^b 19, 77^b 30, 84^b 26.

Possible Θ. 4, 19^b 28.

Potency, power, def. Δ. 12, Θ. 1–9; whether the elements exist in potency 2^b 33; potency or actuality prior Θ. 8, 3^a 1;)(actuality 7^b 28, 69^b 16, 71^a 6, ^{b} 22; power in geometry 19^b 33, 46^a 7;)(reason, art, nature 25^b 22, 27^a 6, 33^b 8, 49^b 8, 64^a 13; coni. matter 39^b 29, 42^a 27, ^{b} 10, 50^a 15, 60^a 21, 69^b 14, 70^b 12, 71^a 10, 88^b 1, 92^a 3; irrational, rational Θ. 2, 47^b 31, 50^b 33; the potential and the actual are one 45^b 21; in what sense the infinite and the void are potential 48^b 9; when a thing is in potency Θ. 7; primary po-

tency 49^b 13; the potential not eternal 50^b 7; potency is of opposites 50^b 8, 30, 51^a 6, 71^b 19.
Practical knowledge 993^b 21, 25^b 21, 25.
Primary 30^a 10, 37^b 3, 75^b 24; syn. self-subsistent 31^b 14; substance 32^b 1; coni. categories 34^b 9. v. *First.*
Prime numbers 987^b 34.
Principle, beginning (ἀρχή), its meanings Δ. 1; material 983^b 7, 24, 984^a 6, 986^a 17, 987^a 4, 46^a 23; efficient 984^a 27, 46^a 14, ^{b} 3, 49^b 7, 70^a 7, ^{b} 25; final 50^a 7; formal 69^a 28, 76^a 24, 80^b 6, 32; God a first principle 983^a 8; contrary principles 986^a 22, ^{b} 1, 4^b 31, 75^a 28, 87^a 30; principles of demonstration 993^b 28, 996^b 26, 5^b 9, 11, 13, 18, 22, 6^a 5, 62^a 3; a first principle necessary *α.* 2; whether genera are first principles 998^a 21, 42^a 14; whether one in kind or in number Λ. 4–5, 999^b 24, 60^b 29; whether the same for things perishable and imperishable 0^a 5; whether potential or actual 2^b 32; whether universal or individual M. 10, 3^a 7, 60^b 20, 69^a 26–30, 71^a 20; of being as such Γ. 1, E. 1, K. 1; the simple a principle 59^b 34;)(element 41^b 31, 70^b 25; in what sense unity is a principle 84^b 18; the principles, how related to the good 91^a 30, 92^a 11; infinity of principles (Anaxagoras) 984^a 13; ten (Pythagorean) 986^a 22.
Prior, its meanings Δ. 11; in generation, nature 989^a 15; in knowledge, formula, perception 18^b 30; in formula, knowledge, time 28^a 32, 38^b 27 (?); in formula, substance, time 49^b 11; in generation, form, substance 50^a 4; in formula 54^a 28, 78^a 10; in formula, substance 77^b 1; no Idea of a class which includes prior and posterior members 999^a 6; numbers related as prior and posterior 80^b 12.
Privation 4^a 12, 19^b 7, 58^b 27; its meanings Δ. 22, 46^a 31; one of two contraries privative 4^b 27, 11^b 18, 55^b 14, 27, 61^a 20, 63^b 17;)(state, form 19^b 7, 44^b 32, 55^b 13, 70^b 12; primary 46^b 14; perfect 55^a 35, 61^a 20;)(negation, contrariety, 4^a 12, 55^a 33; privative negation 56^a 17, 29.
Production, v. *Generation.*
Productive knowledge 982^a 1, ^{b} 11, 25^b 21, 25;)(mathematical 64^a 1.
Proof, negative (ἔλεγχος) 6^a 11.
Protagoras Γ. 5, 6, K. 6, 998^a 3, 7^b 22, 47^a 6, 53^a 35.
Pythagoras 986^a 30 (?).
Pythagoreans 985^b 23–986^b 8, 987^a 13–27, ^{b} 11, 23, 31, 989^b 29–990^a 29, 996^a 6, 1^a 10, 36^b 18, 53^b 12, 72^b 31, 78^b 21, 80^b 16, 31, 83^b 8–19, 90^a 20–35, 91^a 13, 23; referred to 998^a 7 (?), 2^a 11, 4^b 31, 17^b 20, 28^b 16, 75^a 36, ^{b} 28, 76^a 17.

Qua, def. 65^b 24.
Quality Δ. 14, 28^a 15, 68^b 19; of number 20^b 3; definite 63^a 27; change of 69^b 10; posterior to quantity 83^a 11.
Quantity Δ. 13; attributes of 20^a 19; known by a measure 52^b 20; indefinite 63^a 27; change of 69^b 10; prior to quality 83^a 11; motion and time incidentally quantitative 20^a 29.

Ratio (λόγος) 985^b 32, 991^b 13, 17, 19, 993^a 17, 1^b 30, 53^a 16, 61^b 1, 92^b 14, 31.
Reality, realization, complete (ἐντελέχεια))(matter 38^b 6, 78^a 30; separates 39^a 7; coni. substance 44^a 9;)(actuality 47^a 30, 50^a 23.
Reason, v. *Mind.*
Relative, the Δ. 15, 56^b 34, 89^b 7, 14; Ideas of 990^b 16, 79^a 12;)(absolute 990^b 20; least substantial of the categories 88^a 22, 30.

Same, the 995^b 21, 21^a 11; its meanings Δ. 9, 54^a 32; in species 18^b 7, 49^b 18, 29, 58^a 18; by accident 37^b 6.
Scale 985^b 31, 986^a 5; seven scales 93^a 13.
Science, v. *Knowledge.*
Sensation, sense (αἴσθημα) 10^b 32, 63^b 4; (αἴσθησις) sight our most precious sense 980^a 23; sensation the source of all knowledge 980^a 28;)(wisdom 981^b 10;)(know-

ledge 999b 3; a physical alteration 9b 13; special sensation always true 10b 2; conflict of sensations 10b 4, 11a 25; conj. intuition 36a 6.

Sensible 987a 33, 997b 12, 10a 3, 42a 25, 69a 30, b 3, 78b 16;)(mathematical 989b 32, 990a 15; no knowledge of sensible things Z. 15, 987a 34;)(intelligible, ideal 990a 31, 999b 2, 36a 3, 10, 45a 34, 90b 35; are there non-sensible substances 997a 34, 2b 12, 59a 39; conj. motion 989b 32, 36b 29; contrarieties 61a 32.

Sense-organ 63a 2.

Separable 17b 25, 25b 28, 26a 9, 28a 34, 40a 9, 59b 13, 60a 8, 78b 30, 86a 33; in formula)(without qualification 42a 29; in actuality)(in knowledge 48b 15.

Separate (verb) 989b 3, 40b 28, 78b 31, 86b 4.

Separate (adj.) 40b 6.

Seven (Pythagorean) 93a 13.

Shape, conj. end 23a 34; conj. formula 42a 28; conj. actuality 43a 25, 28, 31; = proximate matter 45b 18; conj. form 999b 17, 15a 6, 17b 25, 33b 5, 44b 22, 52a 22, 60a 22, b 26.

Sight, the most precious sense 980a 23.

Simonides 982b 30, 91a 7.

Simple, conj. necessary 15b 12; conj. principle 59b 35;)(one 72a 32; bodies 984a 6; concepts, substance 27b 27, 41b 9, 72a 32; movement 53a 9, 73a 29; generation 69b 10, 88a 33.

Snub Z. 5, 25b 31.

Socrates 987b 1–4, 78b 17–31, 86b 3.

Socrates the younger 36b 25.

Sophistic 4b 18; concerned with non-being 26b 14; sophistical objections 32a 6, 49b 33.

Sophists 996a 32, 4b 17, 26b 15.

Sophocles 15a 30.

Soul, partly falls within scope of physics 26a 5; substance of living things 35b 14, 43a 35; = its essence 36a 2, 43b 2;)(soulless things 46a 36;)(reason, not all soul can survive death 70a 26.

Species 998b 7; indivisible 998b 29, 34a 8; one in species 999a 2, 16b 31, 18b 7, 49b 18, 29, 58a 18; part of genus 999a 4, 23b 18, 25; other in species I. 8, 9, 18b 1, 54b 28; genus part of species 23b 24; genus matter of species 24b 8, 38a 6; species composed of genus and differentiae 39a 26, 57b 7.

Speusippus 28b 21, 72b 31; referred to 75a 36, b 37, 80b 14 (?), 21 (?), 91a 34, 92a 11.

Spheres of the stars Λ. 8.

Spontaneity, conj. luck,)(nature, art 984b 14, 32a 13, b 23, 34a 10, b 4, 70a 7.

Stars Λ. 8; their nature 73a 34.

State, v. *Habit*.

Strife (Empedocles) 0a 27.

Substance Z and H *passim*; its meanings Δ. 8, Λ. 1; = ultimate subject 983b 10, 2a 3, 7a 31, 17b 13, 19a 5, 29a 8, 38b 15, 42a 26;)(affection, accident 983b 10, 985b 10, 7a 31, 38b 28, 71a 1; material 985b 10, 992b 1, 42b 9, 44a 15, 49a 36, 77a 36; are numbers substances? 987a 19, 1b 26, 36b 12, 76a 31; sensible substance 997a 34, 42a 25, 69a 30, b 3; = form 987b 21, 993a 18, 32b 1, 35b 22, 37a 29, 38b 14, 41b 9, 50b 2; are there non-sensible substances? 997a 34, 59a 39; universals not substance Z. 13, 3a 7, 53b 16, 60b 21, 69a 26–30, 87a 2; primary being 28a 14, 30; prior in formula, knowledge, time 28a 32; alone separable 28a 34; four notions of it 28b 33; whether matter is substance Z. 3, 42a 27, 49a 36, 77a 36; syn. individual 30a 19; primary 32b 1; = matter, form, and concrete thing 35a 1, 70b 13;)(concrete thing 35b 22, 37a 29;)(genus 42a 21, 53b 21; being not the substance of things 40b 18; unity not the substance I. 2, 40b 18; a principle and cause 41a 9, b 30, 43a 2; generally recognized substances 42a 6; natural 42a 8, 70a 5; mathematical objects as substances M. 1–3, 42a 11, 69a 35; conj. actuality, complete reality 42b 10, 43a 23, 35, 44a 9, 50b 2, 72a 25; prior in 49b 11, 50a 4, 77b 1; incomposite 51b 27; concrete 54b 4; eternal, unmovable substance Λ. 6; why are there many substances? 89b 31.

INDEX

Substratum, def. 28^b 36; two meanings 38^b 5, 49^a 28 (?); syn. matter 983^a 30, 985^b 10, 992^b 1, 22^a 18, 70^a 11; proximate, ultimate 16^a 20, 23, 17^b 24, 24^b 10;)(matter 44^b 9.
Successive, def. 68^b 31;)(identical 5^a 11; in numbers 85^a 4.
Syllogism, starts from the 'what' 34^a 31, 78^b 24; primary syllogisms 14^b 2.

Ten, limit of the number-series 986^a 8, 73^a 20, 84^a 12; ten principles (Pythagorean) 986^a 22.
Thales 983^b 20, 984^a 2; referred to 996^a 9.
Theology 26^a 19, 64^b 3.
Theoretical knowledge E. 1, 993^b 20.
Thinking (νόησις))(making 32^b 15; coni. formula 52^a 29, ^{b} 1, 75^a 3;)(faculty of thought Λ. 7, 9;)(desire 72^a 26; its primary object 72^a 27.
'Third man' 990^b 17, 59^b 8.
'This' 17^b 25. v. *Individual.*
Thought (νοῦς), v. *Mind.*
Time, incidentally quantitative 20^a 29; prior in 28^a 32, 38^b 27, 49^b 11; eternal 71^b 7.
Timotheus 993^b 15.
Total (πᾶν))(whole, all 24^a 1, 8.
Truth 993^a 30, ^{b} 20, 9^a 1, ^{b} 2; def. Θ. 10, 11^b 25; absolute, relative 11^b 3; being as truth E. 4, Θ. 10, 65^a 21.
Two, v. *Dyad.*

Unequal, the 87^b 5, 88^b 32, 89^b 6–15, 91^b 35; inequality 1^b 23.
Unit, def. 16^b 25, 89^b 35; point without position 84^b 26; specifically the same, addible, M. 6–8, 991^b 24; specifically different, inaddible M. 6–8, 992^a 3; differentia of 83^a 1; unitary numbers 80^b 19, 30, 82^b 6.
Universal 42^a 15, 86^a 33; def. 23^b 29, 38^b 11; not substance Z. 13, 3^a 7, 53^b 16, 60^b 21, 69^a 26–30, 87^a 1; whether the first principles are M. 10, 3^a 7, 60^b 19, 69^a 26–30, 71^a 20; object of knowledge 3^a 14, 36^a 28, 59^b 26, 60^b 20, 87^a 15; essential (καθ' αὑτά) 17^b 35; prior in formula 18^b 32;)(genus 28^b 34.
Universe, not disjointed 76^a 1.
Unlike, its meanings 18^a 19.

Void 48^b 9; (Democritus) 985^b 5, 9^a 28.

'What' 25^b 31, 26^a 36, 28^a 16, 30^a 17; parts of the 22^a 27; starting-point of syllogism 34^a 31, 78^b 24.
Whole 13^b 22, 52^a 22; its meanings Δ. 26;)(total 24^a 1.
Wisdom, philosophy (σοφία) A. 1; with what principles it deals A. 2, K. 1, 2, 995^b 12, 996^b 9; with first causes 981^b 28.

Xenocrates referred to 80^b 14 (?), 21 (?), 91^b 35.
Xenophanes 986^b 21–27, 10^a 6.

Zeno 1^b 7.
Zeus 91^b 6.

OXFORD
PRINTED AT THE CLARENDON PRESS
BY HORACE HART, M.A.
PRINTER TO THE UNIVERSITY